

EXHIBIT 105

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

IN RE NATIONAL PRESCRIPTION
OPIATE LITIGATION

MDL NO. 2804

This document relates to:

Case No. 17-md 2804

*County of Summit, Ohio, et al. v. Purdue Pharma
L.P., et al.*
Case No. 1:18-op-45090

Hon. Dan Aaron Polster

*The County of Cuyahoga v. Purdue Pharma L.P., et
al., Case No. 17-op-45004*

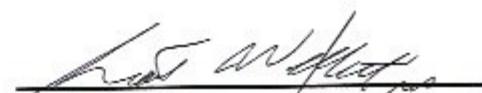
**DECLARATION OF SCOTT L. WEXELBLATT, M.D. IN SUPPORT OF MOTION OF
PLAINTIFFS COUNTIES OF CUYAHOGA AND SUMMIT, OHIO, FOR PARTIAL
SUMMARY ADJUDICATION REGARDING PLAINTIFFS' EQUITABLE CLAIMS FOR
ABATEMENT OF AN ABSOLUTE PUBLIC NUISANCE**

Pursuant to 28 U.S.C. § 1746, I hereby declare as follows:

1. A true and accurate copy of the report of my opinions in this matter and that I understand was produced to the Defendants on or about March 25, 2019, is attached hereto as Exhibit A.
2. If called to testify at trial, I would testify consistent with the opinions and other matters set forth in my report attached as Exhibit A.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 27, 2019



Scott L. Wexelblatt, M.D.

Exhibit A

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IN RE: NATIONAL PRESCRIPTION OPIATE LITIGATION-MDL No. 2804

SCOTT L. WEXELBLATT, MD EXPERT REPORT

MARCH 25, 2019

Confidential**TABLE OF CONTENTS**

I.	BACKGROUND AND QUALIFICATIONS	3
II.	BRIEF SUMMARY OF OPINIONS	5
III.	BASIS FOR OPINIONS	7
A.	Opioid Use in the United States and Ohio	7
B.	Rates of Opioid Exposure Among Women in the US and Ohio.....	8
C.	Guidelines and Interventions for Pregnant Women with Opioid Use Disorder ...	12
D.	Neonatal Abstinence Syndrome.....	14
1.	The Rapidly Increasing Rate of NAS in Ohio	16
2.	The Rates of NAS in Cuyahoga and Summit Counties	18
3.	Standard Treatments and Interventions for NAS	18
4.	Long-Term Care for Children and Families Impacted by Opioids	20
5.	Current Ohio Initiatives Relating to NAS.....	21
IV.	RECOMMENDATIONS FOR IMPROVING OUTCOMES	22
A.	Prevention	22
B.	Education and Training.....	23
C.	Supportive Services and Interventions.....	23
V.	DISCLOSURES AND RESERVATION OF RIGHTS.....	24

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I. BACKGROUND AND QUALIFICATIONS

1. My name is Scott L. Wexelblatt, MD. I am the Regional Medical Director of Newborn Services at Cincinnati Children's Hospital Medical Center and an Associate Professor in the Department of Pediatrics, University of Cincinnati College of Medicine.
2. I have been asked to provide an expert opinion on the effects of opioid addiction on pregnant mothers and infants with a focus on neonatal abstinence syndrome (NAS) and its impact on Cuyahoga and Summit Counties (collectively, “the Counties”).
3. I am a pediatrician and researcher focused on improving perinatal health outcomes in regional populations. I am currently the Regional Director of Newborn Services for Cincinnati Children's Hospital Medical Center (CCHMC) Perinatal Institute, which serves eight level 2 hospitals and three level 1 nurseries in our region.
4. I am a faculty member of Ohio Perinatal Quality Collaborative (OPQC) on the Neonatal Abstinence Syndrome project. OPQC is a statewide consortium of perinatal clinicians, hospitals, policymakers and governmental entities that aims, through the use of improvement science, to reduce preterm births and to improve perinatal and birth outcomes in Ohio. OPQC has been working in collaboration with the Ohio Department of Mental Health and Addiction Services (ODHMAS), the Ohio Department of Medicaid (ODM), and the Ohio Department of Health (ODH) to improve outcomes for pregnant women with opioid use disorder and their infants.
5. As the regional faculty representative for the Ohio Children's Hospital Association (OCHA) subcommittee on neonatal abstinence syndrome, I helped establish a protocol for NAS for twenty Ohio children's and maternity hospitals.¹ I led the data analysis and was a co-first author on a publication of key findings from OCHA. OCHA's findings showed improved outcomes following an infant's in utero exposure to opioids through the utilization of standard treatment protocols with stringent weaning guidelines.²
6. Based on our primary findings, I helped establish a standardized protocol for NAS, and spread this new protocol to hospitals to implement. I was the co-author and led the data analysis on our publication showing marked improvement with implementation of this protocol.³

¹ Hall ES, Wexelblatt SL, Crowley M, et al. A Multicenter Cohort Study of Treatments and Hospital Outcomes in Neonatal Abstinence Syndrome. *Pediatrics*. 2014;134(2):e527-534. Six hospitals' neonatology groups covered newborn nurseries in twenty hospitals. The six hospitals included Rainbow Babies and Children's Hospital (Cleveland); Akron Children's Hospital; Cincinnati Children's Hospital; Dayton Children's Hospital; Nationwide Children's Hospital (Columbus); ProMedical Toledo Children's Hospital.

² *Ibid.*

³ Hall ES, Wexelblatt SL, Crowley M, et al. Implementation of a Neonatal Abstinence Syndrome Weaning Protocol: A Multicenter Cohort Study. *Pediatrics*. 2015;136(4):e803-810.

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7. Building upon my work with the OCHA collaborative, I served as a primary or co-investigator in several additional regional analyses designed to provide evidence for further optimizing NAS guidelines.⁴ Analyses of outcomes following methadone versus buprenorphine weaning and a comparative effectiveness evaluation of conventional methadone weaning versus weaning with a pharmacokinetic modeled methadone protocol were published.^{5,6}
8. Through my role as a faculty member of the OPQC, I am currently participating in disseminating the OPCQ's findings to 52 delivery hospitals in Ohio to improve the care of the opioid-exposed infant. Through our statewide collaborations of OCHA and OPQC, we have created a standardized protocol to safely decrease the length of hospital stay.⁷
9. In my role as Regional Director of Newborn Care, I led the implementation of universal maternal testing in 18 hospitals in Southwest Ohio after demonstrating in a pilot study that universal testing was superior to the risk-based screen which was being utilized at that time. This has led to earlier identification and diagnosis of opioid exposed neonates, leading to improved hospital care, and an improved discharge care plan and follow up.⁸
10. I received a B.A. *cum laude* from the University of Delaware (Psychology) in 1992 and an M.D. from University of Vermont College of Medicine in 1996. I completed postgraduate training, pediatric residency and internship at the Cincinnati Children's Hospital Medical Center (1996-1999).
11. I am licensed to practice medicine in the State of Ohio and Board Certified by the American Board of Pediatrics (1999 with recertifications in 2007 and 2015).
12. My curriculum vitae, a copy of which is attached as **Exhibit A**, further describes my education, background, and qualifications. In addition, it lists those matters in which I have testified as an expert at trial or deposition within the past four years.

⁴ Walsh MC, Crowley M, Wexelblatt S, et al. Ohio Perinatal Quality Collaborative Improves Care of Neonatal Narcotic Abstinence Syndrome. *Pediatrics*. 2018;141(4).

⁵ Hall ES, Rice WR, Folger AT, Wexelblatt SL. Comparison of Neonatal Abstinence Syndrome Treatment with Sublingual Buprenorphine versus Conventional Opioids. *American Journal of Perinatology*. 2018;35(4):405-412.

⁶ Hall ES, Isemann BT, Wexelblatt SL, et al. A Cohort Comparison of Buprenorphine versus Methadone Treatment for Neonatal Abstinence Syndrome. *The Journal of Pediatrics*. 2016;170:39-44 e31.

⁷ Hall, *Pediatrics* (2015)

⁸ Wexelblatt SL, Ward LP, Torok K, Tisdale E, Meinzen-Derr JK, Greenberg JM, Universal Maternal Drug Testing in a High-Prevalence Region of Prescription Opiate Abuse. *The Journal of Pediatrics*, 2015, 166 (3); 582-586.

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13. I have authored or coauthored numerous publications, the title and citations of which are also listed on **Exhibit A**. This list includes publications I have authored or co-authored in the last ten years.
14. I am being compensated at a rate of \$650 per hour for my services in this litigation. I am also being reimbursed for all reasonable expenses incurred for my work on this litigation. No part of my compensation is contingent upon the outcome of this litigation, and I have no interest in the litigation or with either party.

II. BRIEF SUMMARY OF OPINIONS

15. Based upon my qualifications, experiences and research, as well as the information referenced in this report, I plan to offer the opinions set forth below. This report draws upon my professional experiences, research and participation in studies as outlined in my qualifications relating to opioid exposed infants, a literature search of scientific publications and publications from authoritative sources such as the Center for Disease Control (CDC), the Substance Abuse and Mental Health Services Administration (SAMSHA), the American College of Obstetricians and Gynecologists (ACOG), World Health Organization (WHO), Ohio Department of Mental Health and Addiction Services (ODHMAS), Ohio Department of Health (ODH), Ohio Department of Medicaid (ODM), and the Ohio Perinatal Quality Collaborative (OPQC).
 - a. The use and exposure of opioids among pregnant women continues to grow throughout the United States.
 - b. Neonatal abstinence syndrome (NAS) is a clinical diagnosis given to infants who experience withdrawal signs and symptoms after in utero exposure to opioids.
 - c. Withdrawal signs develop in 55% to 94% of opioid exposed infants, with 30-65% of those infants requiring pharmacologic treatment for severe withdrawal.
 - d. The increasing number of women with opioid use disorder in Cuyahoga and Summit Counties and the growing incidence of NAS, is a significant public health issue. The Counties will need to build upon existing programs and develop new multidisciplinary programs to improve the outcomes of women with opioid use disorder, mothers, and infants. As the rate of infants born with NAS continues to climb, additional and enhanced services are needed in Cuyahoga and Summit Counties, including programs focused on prevention, treatment, and early intervention.
 - e. Preventing opioid exposure among women of childbearing age and pregnant women will greatly reduce the number of babies with narcotic exposure and reduce the need for treatment of NAS.
 - f. Effective prevention programs will need to educate women of childbearing age about substance abuse prevention and raise awareness of the effects of opioid use

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prior to and during pregnancy, and provide counseling for women being treated for opioid use disorder.

- g. Emergency rooms, health clinics, community drug treatment centers, and other service providers should expand screening programs in order to identify women in need of intervention and treatment referral.
- h. Any programs geared towards prevention and/or treatment must recognize barriers to treatment for women during pregnancy, delivery and postpartum.
- i. Standardized NAS assessment and treatment protocols improve outcomes for care for opioid-exposed infants in Ohio.
- j. Universal maternal screening prenatally and testing at the time of delivery improves the identification of infants at risk for the development of NAS.
- k. Pharmacological support with opioids has been shown to be the best treatment when medication is needed for withdrawal for babies with NAS.
- l. Existing medication assisted treatment (MAT) programs should be expanded, along with coordinated supportive services that mitigate barriers women may experience in accessing these treatment.
- m. Access to buprenorphine replacement therapy, which can decrease the severity of newborn withdrawal, should be expanded.
- n. Continued study on long terms outcomes and personalized pharmacological treatment are important for the optimization of outcomes for opioid-affected babies.
- o. The effective long-term care of children and families impacted by opioids will require programs that provide: family-centered care, such as residential care for pregnant and postpartum women with opioid use disorder; comprehensive pediatric care, such as regular preventative care for children; and developmental follow-up programs for children, which may include regular developmental screening, occupational therapy, and physical therapy.
- p. It is my opinion that an optimal maternal care program would allow women with opioid use disorders to be identified during pregnancy and subsequently provided with prenatal care and other supportive services. The program would provide for the development of an individualized treatment care plan for both mother and baby, as well as a discharge plan with home visitation, early intervention services, and referrals to other supportive services. Care would be coordinated through an interdisciplinary team that may include specialists in perinatology, neonatology, addiction medicine, psychiatry, social work, case management, and nutrition. Referrals to the program would come from throughout the community, including emergency departments, obstetric triage, women's health centers, family medicine

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providers, addiction medicine providers, community drug treatment centers, and hospitals.

III. BASIS FOR OPINIONS

A. Opioid Use in the United States and Ohio

16. The use of opioids has escalated throughout the United States resulting in an epidemic of opioid misuse, overdose, and death. As a consequence, there are more than 131 opioid overdose deaths in the United States each day.⁹
17. As of 2017, overdose deaths involving prescription opioids were five times higher than they were in 1999.¹⁰ In addition to overdose deaths, the Center for Disease Control and Prevention (CDC) reports that “nonfatal overdoses from both prescription and illicit drugs are responsible for increasing emergency department visits and hospital admissions.”¹¹
18. Ohio has been recognized as among the top five states with the highest rates of opioid related overdose deaths.¹² According to the Ohio Department of Health, “from 2000 to 2017, Ohio’s death rate due to unintentional drug poisonings increased 1,081 percent, and the increase in deaths has been driven largely by opioid-related overdoses.”¹³ In 2016, Ohio had a rate of 32.9 opioid-related overdose deaths per 100,000 persons – more than double the national average.¹⁴

⁹ U.S. Department of Health and Human Services (HHS), Office of the Surgeon General, *Facing Addiction in America: The Surgeon General’s Spotlight on Opioids*. Washington, DC: HHS, September 2018.

¹⁰ Centers for Disease Control and Prevention (CDC). 2018 Annual Surveillance Report of Drug-Related Risks and Outcomes — United States. Surveillance Special Report. Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. Published August 31, 2018. Available at <https://www.cdc.gov/drugoverdose/pdf/pubs/2018-cdc-drug-surveillance-report.pdf>.

¹¹ *Ibid.*

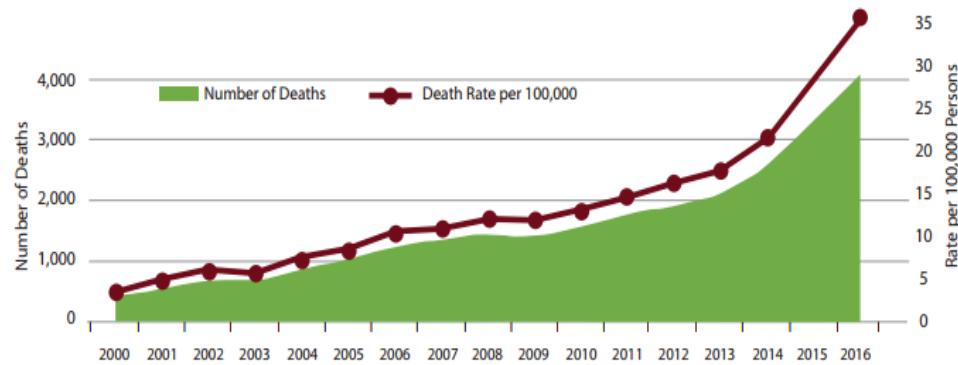
¹² National Institute on Drug Abuse (NIDA), *Opioid-Related Overdose Deaths: Ohio*, February 2018. Available at <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-summaries-by-state/ohio-opioid-summary>.

¹³ Ohio Department of Health, *Drug Overdose*, July 2, 2018. Available at <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/Drug-overdose/>.

¹⁴ NIDA 2018

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Figure 8. Number of Deaths and Annual Age-Adjusted Death Rate* per 100,000 Population from Unintentional Drug Overdose by Year, Ohio Residents, 2000-2016

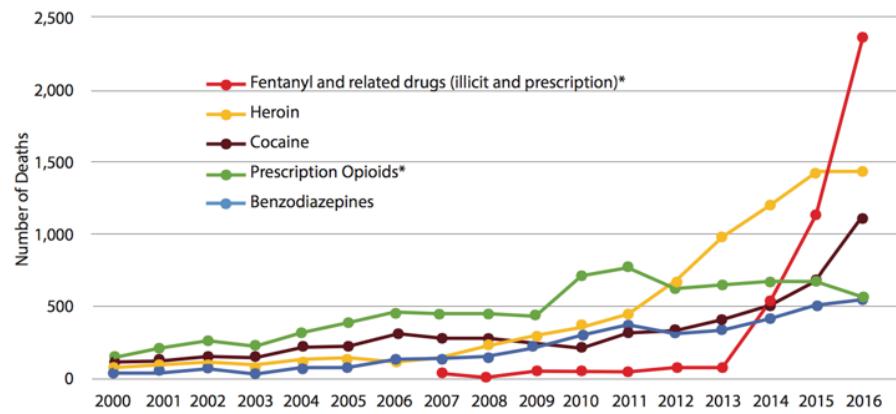


Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.

*The death rate is presented as age-adjusted which allows a comparison of death rates between populations (e.g. counties and states). The rates are adjusted to the U.S. 2000 standard population to allow a comparison of the overall risk of dying between different populations.

Unintentional Overdoses Involving Select Drugs and Age-Adjusted Death Rate

Figure 7. Number of Unintentional Drug Overdose Deaths Involving Selected Drugs, by Year, Ohio, 2000-2016



Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.

Multiple drugs are usually involved in overdose deaths. Individual deaths may be reported in more than one category.

Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

* Excludes deaths involving fentanyl and related drugs.

B. Rates of Opioid Exposure Among Women in the US and Ohio

19. Opioid use among women has increased dramatically.¹⁵

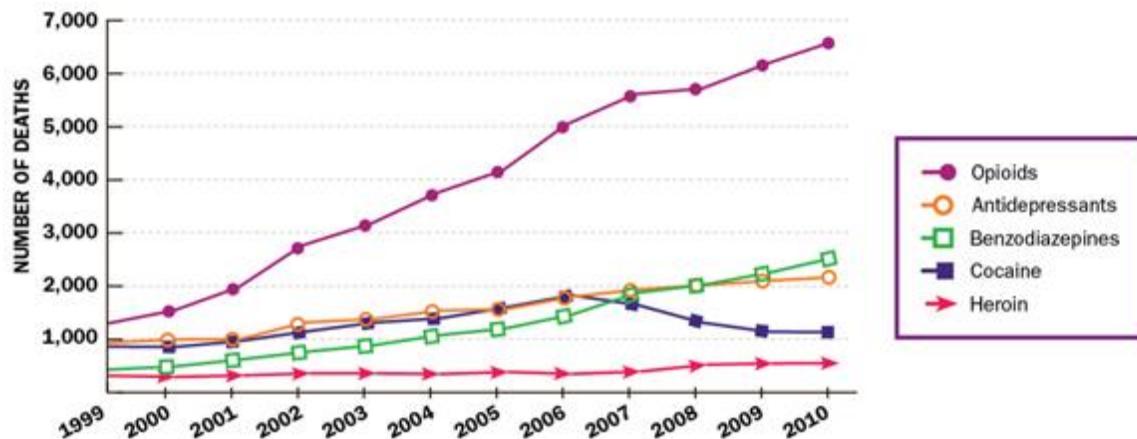
¹⁵ American Society of Addiction Medicine (ASAM), *Opioid Addiction, 2016 Facts and Figures*. Available at <https://www.asam.org/docs/default-source/advocacy/opioid-addiction-disease-facts-figures.pdf>.

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20. In 2013, the CDC highlighted the growing epidemic of prescription opioid overdoses among women, finding:

- About 18 women die every day of a prescription painkiller overdose in the U.S., more than 6,600 deaths in 2010;
- Prescription painkiller overdoses are an under-recognized and growing problem for women;
- Between 1999 and 2010, overdose deaths from prescription painkillers increased more than 400% among women, compared to an increase of 237% among men;
- Between 2002 and 2013, heroin use among women increased 100% compared to an increase of 50% among men;
- Nearly 48,000 women died of prescription painkiller overdoses between 1999 and 2010;
- For every one woman who dies of a prescription painkiller, thirty go to the emergency room for painkiller misuse or abuse.
- Every three minutes, a woman goes to the emergency department for prescription painkiller misuse or abuse;
- Women between the ages of 25 and 54 are most likely to go to the emergency department because of prescription painkiller misuse or abuse.¹⁶

Prescription painkiller overdose deaths are a growing problem among women.



¹⁶ CDC, *Vital Signs* (2013)

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SOURCE: National Vital Statistics System, 1999-2010 (deaths include suicides)

Drug overdose deaths among women, by select drug class, United States, 2004-2010. Data from National Vital Statistics System

21. Between 2000 and 2009, maternal antepartum opioid use increased from 1.19 to 5.63 per 1000 hospital births annually.¹⁷ Between 2005 and 2011, more than 14% of pregnant women were legally dispensed an opioid at some time during pregnancy.¹⁸
22. By 2011, more than 1% of pregnant women used opioid-based pain relievers or heroin illicitly.¹⁹ By 2012, 27.7% of privately insured and 39.4% of Medicaid insured-women of reproductive age filled prescriptions for opioid medications.²⁰
23. According to the CDC, women are more likely to experience chronic pain and use prescription opioid pain medications for longer periods and in higher doses than men.²¹ Studies have also shown that women who use opioids progress to dependence more quickly than men and experience more cravings than men;²² that psychological and emotional distress are identified as risk factors for hazardous opioid prescription use among women but not men;²³ and that women who are caregivers may face additional barriers to treatment for substance abuse disorder such as lack of childcare.²⁴

¹⁷ Patrick SW, Schumacher RE, Benneyworth BD, Krans EE, McAllister JM, Davis MM. Neonatal Abstinence Syndrome and Associated Health Care Expenditures: United States, 2000-2009. *JAMA : the Journal of the American Medical Association*. 2012;307(18):1934-1940.

¹⁸ Bateman, BT, et al, Patterns of Opioid Utilization in Pregnancy in a Large Cohort of Commercial Insurance Beneficiaries in the United States. *Anesthesiology*. 2014;120(5): 1216-1224

¹⁹ Hall, *Pediatrics* (2016).

²⁰ Ailes EC, Dawson AD, Lind JN, Gilboa SM, Frey MT, Broussard CS, and Honein MA. CDC. Opioid Prescription Claims Among Women of Reproductive Age – United States, 2008-2012. *MMWR*. 2015 Jan 23;64(2):37-41.

²¹ Centers for Disease Control and Prevention. Prescription Painkiller Overdoses. *Vital Signs*. July 2013. Available at <http://www.cdc.gov/vitalsigns/prescriptionpainkilleroverdoses/index.html>.

²² Back SE, Payne RL, Wahlquist AH, et al. Comparative Profiles of Men and Women with Opioid Dependence: Results from a National Multisite Effectiveness Trial. *The American Journal of Drug and Alcohol Abuse*. 2011;37(5):313-323.

²³ Back, SE, Lawson, K, Singleton, L, and Brady, KT. Characteristics and Correlates of Men and Women with Prescription Opioid Dependence. *Addict Behav*. 2011; August; 36(8): 829-834.

²⁴ Center for Substance Abuse Treatment. Substance Abuse Treatment: Addressing the Specific Needs of Women: Treatment Improvement Protocol (TIP) series 51; vol HHS publication no. (SMA) 09-4426. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2009

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24. Unintended pregnancy rates among women with substance abuse disorders are approximately 80 percent, considerably higher than the rate of unintended pregnancies in the general population.²⁵ According to guidance issued by the Substance Abuse and Mental Health Services Administration (SAMSHA) concerning the treatment of pregnant and parenting women with opioid use disorder, “preventing unintended pregnancies and planning for future pregnancies is critical.”²⁶ SAMSHA recommends that healthcare professions should offer women with opioid use disorder “non-coercive contraception counseling” for prior to leaving the hospital.²⁷
25. Opioid use during pregnancy has increased dramatically in recent years as a growing number of women of childbearing age suffer from opioid use disorder.²⁸ In Ohio, over 4,200 pregnant women were admitted to treatment between 2004 and 2011.²⁹
26. Increases in opioid use among pregnant women includes increases in the use of prescription opioids, medication assisted treatment, increases in illicit drug use.³⁰ Studies have shown substance use during pregnancy to be a ubiquitous problem affecting women across racial, socioeconomic status, and age categories.³¹
27. The increase in utilization of opioids by women of reproductive age and pregnant women is particularly concerning because of the potential effects both on the women and their unborn children.

²⁵ The American College of Obstetricians and Gynecologists. ACOG Committee Opinion, Number 711. Opioid use and opioid use disorder in pregnancy. Available at <https://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Opioid-Use-and-Opioid-Use-Disorder-in-Pregnancy>. Published August 2017.

²⁶ Substance Abuse and Mental Health Services Administration. *Clinical Guidance for Treating Pregnant and Parenting Women with Opioid Use Disorder and Their Infants*. HHS Publication NO. (SMA) 18-5054. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2018.

²⁷ *Ibid.*

²⁸ Haight SC, Ko JY, Tong VT, Bohm MK, Callaghan WM. Opioid Use Disorder Documented at Delivery Hospitalization — United States, 1999–2014. *MMWR Morb Mortal Wkly Rep.* 2018;67:845–849. DOI: <http://dx.doi.org/10.15585/mmwr.mm6731a1>.

²⁹ Massatti, R., Falb, M., Yors., Potts, L., Beghly, C. & Starr, S., (2013, November) Neonatal abstinence syndrome and drug use among pregnant women in Ohio, 2004-2011. Columbus, OH: Ohio Department of Mental Health and Addiction Services.

³⁰ Reddy, U. M., Davis, J. M., Ren, Z., & Greene, M. F. (2017). Opioid use in pregnancy, neonatal abstinence syndrome, and childhood outcomes: executive summary of a joint workshop by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, American College of Obstetricians and Gynecologists, American Academy of Pediatrics, Society for Maternal-Fetal Medicine, Centers for Disease Control and Prevention, and the March of Dimes Foundation. *Obstetrics & Gynecology*, 130(1), 10-28.

³¹ ACOG Committee Opinion, Number 711 (2017)

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28. Opioid use in pregnant women presents risks for the fetus and newborn child. Maternal detoxification can increase the risk of fetal distress and fetal loss.³² As discussed in greater detail below, untreated opioid use disorder during pregnancy can have devastating consequences for the unborn baby due to the potential for repeated periods of withdrawal.³³ Other risks to the baby include stunted growth, preterm labor, fetal convulsions, and fetal death.³⁴ Long-term, studies have shown that toddlers and young school age children with prenatal opioid exposure are more likely to have impairments in cognition as well as poorer psychomotor and behavioral outcomes.³⁵ The mother may also be at increased risk of HIV, HBV, HCV, malnutrition and dangers associated with drug seeking behaviors.³⁶

C. Guidelines and Interventions for Pregnant Women with Opioid Use Disorder

29. In 2014, the World Health Organization published guidelines to promote evidence-based advice to health care providers on identifying and managing substance use and substance use disorders in pregnant women. The guidelines strongly recommended that opioid-dependent pregnant women be encouraged to use opioid maintenance treatment (methadone or buprenorphine) whenever available rather than to attempt opioid detoxification. The risk of harm from opioid maintenance treatment is very low as compared to the high risk of relapse to opioid use following detoxification or the “catastrophic” harm to both mother and fetus from failed detoxification. Also strongly recommended was that mothers who are on methadone or buprenorphine maintenance treatment be encouraged to breastfeed unless the risks outweighed the benefits.³⁷
30. In 2017, The American College of Obstetricians and Gynecologists’ (ACOG), Committee on Health Care for Underserved Women and the American Society of Addiction Medication (ASAM) issued recommendations and conclusions relating to opioid use and opioid use disorder in pregnancy. The Committee Opinion concluded that opioid use in pregnancy has sharply escalated, paralleling the opioid epidemic in the general population and that the use of illicit opioids during pregnancy is associated with an increased risk of

³² Hudak ML, Tan RC, Committee On D, Committee On F, Newborn, American Academy of P. Neonatal drug withdrawal. *Pediatrics*. 2012;129(2):e540-560.

³³ National Institute on Drug Abuse (NIDA), Treating Opioid Use Disorder During Pregnancy, National Institutes of Health; U.S. Department of Health and Human Services, July 2017

³⁴ *Ibid.*

³⁵ Baldacchino, A., Arbuckle, K., Petrie, D. J., & McCowan, C. (2014). Neurobehavioral consequences of chronic intrauterine opioid exposure in infants and preschool children: a systematic review and meta-analysis. *BMC psychiatry*, 14, 104. doi:10.1186/1471-244X-14-104.

³⁶ *Ibid.*

³⁷ World Health Organization: *Guidelines for Identification and Management of Substance Use and Substance Use Disorders in Pregnancy*. October 2014. Available at http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en/

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adverse outcomes. The Committee's opinion is that the current standard of care for pregnant women with opioid dependence is referral for medication-assisted therapy with methadone, but emerging evidence suggests that buprenorphine also should also be considered.^{38,39}

31. Recognizing the urgent need to develop clinical guidelines for professionals who care for pregnant women with OUD and their substance exposed infants, in 2018 SAMSHA published a comprehensive guide identifying effective interventions for pregnant women with OUD and their exposed infants. The guidelines ensure health professionals have access to and aware of up-to-date research addressing opioid use disorders and prenatal exposures. Focused on prenatal, infant and maternal postnatal care, the Guide "recommends feasible, standard approaches to the care of pregnant and parenting women with OUD and their infants that can be adopted in care settings throughout the United States." Recommended practices include prenatal screenings and assessments, use of pharmacotherapy during prenatal and post-natal care, screening and assessment for NAS along with early interventions strategies and developmental assessments for infant care.⁴⁰
32. A recent study published in the American College of Obstetricians and Gynecologists (ACOG) looked at women in Massachusetts with evidence of opioid use disorder who delivered a live born infant between 2012 and 2014. 2.3% (4,154) of deliveries were to women with evidence of opioid use disorder in the year before or after delivery. Two hundred forty-two women experienced an opioid related overdose (231 nonfatal, 11 fatal) in the year before or after delivery. The study found that the year after delivery was an especially vulnerable period for women with evidence of opioid use disorder. Specifically, the highest overdose rates occurred in the period 7-12 months after delivery. Women receiving pharmacotherapy had reduced overdose rates in the early postpartum period. This report demonstrates the need not only for support and intervention for women during pregnancy, but into the first year postpartum to prevent and reduce overdose events.⁴¹
33. Expanding access to MAT is critical to improving outcomes among pregnant women with opioid use disorders. However, despite the established benefits of MAT programs for this population, women may experience a variety of potential barriers to entering treatment and

³⁸ Winhusen T, Wilder C, Wexelblatt SL, Theobald J, Hall ES, Lewis D, et al. Design considerations for point-of-care clinical trials comparing methadone and buprenorphine treatment for opioid dependence in pregnancy and for neonatal abstinence syndrome. *Contemp Clin Trials.* 2014;39:158–65.

³⁹ ACOG Committee Opinion, Number 711 (2017).

⁴⁰ Substance Abuse and Mental Health Services Administration (SAMSHA). *Clinical Guidance for Treating Pregnant and Parenting Women with Opioid Use Disorder and Their Infants.* HHS Publication NO. (SMA) 18-5054. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2018

⁴¹ Schiff D, Nielsen T, Terplan Mishka, Hood M, Bernson D, Diop H, Bharel M, Wilens T, LaRochelle M, Walley A, Land T, Fatal and Nonfatal Overdose Among Pregnant and Postpartum Women in Massachusetts, *American College of Obstetricians and Gynecologists,* 2018;132(2):466–474.

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continuing treatment, and receiving supportive services across the continuum of care.⁴² Such barriers may include: program availability and/or capacity; limited access to family-centered treatment with integrated supports; limited care and long-term supports for infants born with NAS; and/or limited transportation, housing, and employment supports.⁴³ Women may also encounter psychosocial barriers, such as societal bias and stigma.⁴⁴

34. As a result of the potential treatment barriers, it is critical that healthcare workers who provide care for women with substance use disorders receive additional training so as to understand health workers providing care for women with substance use disorders during pregnancy need to understand the complexity of the woman's social, mental and physical problems and to provide the right advice and support throughout pregnancy and the postpartum period.⁴⁵
35. Creating and enhancing programs for postpartum women is also important. The first year postpartum is a very vulnerable time for women with opioid use disorder, and, as noted above, is associated with a high risk of an overdose event.⁴⁶

D. Neonatal Abstinence Syndrome

36. From 2004 and 2014, the diagnosis of opioid abuse or dependence among delivering mothers in Ohio grew by 491 percent.⁴⁷ One of the consequences of the increasing rate of maternal opioid use disorder is an increase in neonatal abstinence syndrome (NAS), a syndrome that may occur in opioid-exposed newborns shortly after birth.⁴⁸

⁴² Center for Substance Abuse Treatment. Substance Abuse Treatment: Addressing the Specific Needs of Women: Treatment Improvement Protocol (TIP) series 51; vol HHS publication no. (SMA) 09-4426. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2009. Cleveland, Lisa & Bonugli, Rebecca. (2014). Experiences of Mothers of Infants with Neonatal Abstinence Syndrome in the Neonatal Intensive Care Unit. *Journal of Obstetric, Gynecologic, and Neonatal Nursing : JOGNN / NAACOG*. 43. 10.1111/1552-6909.12306

⁴³ *Ibid.*

⁴⁴ Cleveland, *JOGNN / NAACOG* (2014).

⁴⁵ World Health Organization: Guidelines for Identification and Management of Substance Use and Substance Use Disorders in Pregnancy. October 2014. Available at http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en/.

⁴⁶ Schiff, *American College of Obstetricians and Gynecologists* (2018).

⁴⁷ Massatti, R., Falb, M., Yors., Potts, L., Beghly, C. & Starr, S., (2013, November) Neonatal abstinence syndrome and drug use among pregnant women in Ohio, 2004-2011. Columbus, OH: Ohio Department of Mental Health and Addiction Services.

⁴⁸ Hudak, *Pediatrics*. 2012.

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37. Neonatal abstinence syndrome is a clinical diagnosis given to infants who experience withdrawal signs and symptoms after in utero exposure to opioids. Withdrawal signs develop in 55% to 94% of opioid exposed infants, with 30-65% of those infants requiring pharmacologic treatment for severe withdrawal.^{49,50,51}
38. The clinical signs of NAS result from central nervous system hyper excitability and autonomic instability. NAS signs can begin within 24 hours of birth after heroin exposure, within 48 hours for short acting prescription opioids, and up to 72 to 96 hours after birth for newborns exposed to long acting opioids such as methadone and buprenorphine.⁵² The most prominent signs in NAS are tremors, poor feeding, excessive crying, loose stools, poor sleeping, and hyperirritability. Other signs of NAS include sneezing, yawning, hiccups, myoclonic jerks, skin breakdown and abrasions, vomiting, nasal stuffiness, and seizures in the most severe cases.⁵³
39. Over the last two decades, the US incidence of NAS has sharply increased from 1.19 per 1000 hospital births in 2000, to 5.63 in 2012.⁵⁴ During that same time period, the number of infants treated for the syndrome in US neonatal intensive care units increased five-fold.⁵⁵

⁴⁹ Hall, *Pediatrics* (2014).

⁵⁰ Patrick, *JAMA* (2012).

⁵¹ Hudak, *Pediatrics* (2012).

⁵² Hall, *Pediatrics* (2014); Hudak, *Pediatrics* (2012).

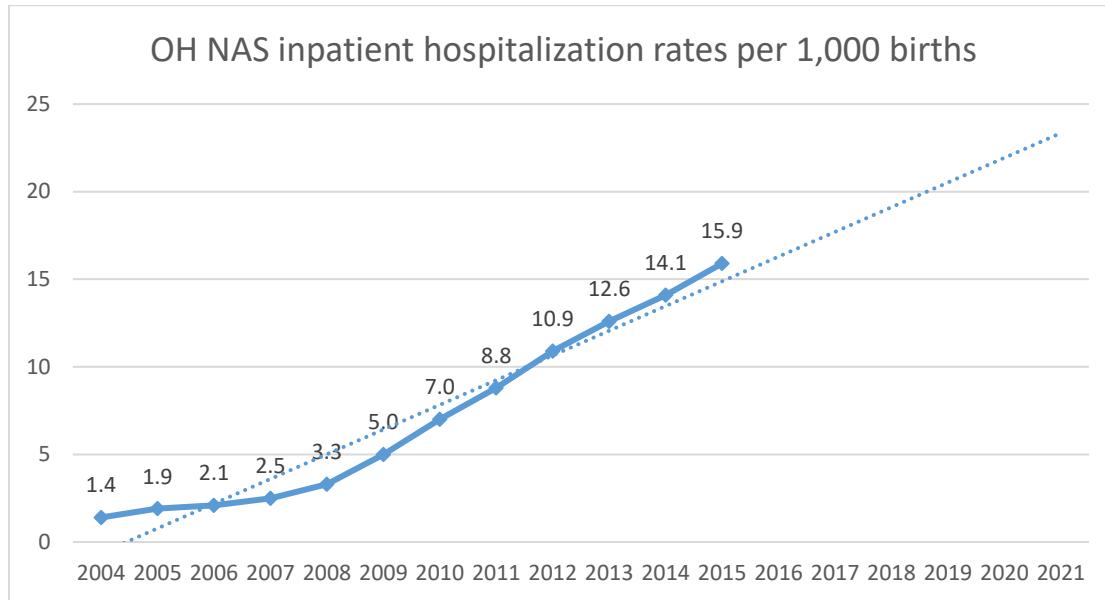
⁵³ Hudak, *Pediatrics*, (2012).

⁵⁴ Patrick, *JAMA* (2012).

⁵⁵ Patrick, *Journal of Perinatology* (2015).

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1. The Rapidly Increasing Rate of NAS in Ohio



40. Between 2006 and 2015, there were 11,283 hospitalizations resulting from Neonatal Abstinence Syndrome (NAS) in inpatient settings in Ohio. According to the Ohio Department of health, “in 2015 alone, there were 2,174 admissions, which equates to nearly six admissions per day.”
41. The diagnosis of NAS continues to increase across the State of Ohio. Since 2012, over 1% off all deliveries in Ohio had the diagnosis of NAS. This rate is projected to be above 2% in the year 2020.⁵⁶
42. The reason for this increase of babies diagnosed with NAS is multifactorial. Notably, the increase in the number of women of childbearing age with opioid use disorder has exposed more babies in utero to opioids.

⁵⁶ Health ODo. 2017 Ohio Neonatal Abstinence Syndrome Report. *Online*. Dec. 11, 2018. Available at https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/media/2017_nas_county_table.

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2017 Ohio Neonatal Abstinence Syndrome Report**Table 1: Hospitalizations* Among Ohio Resident Newborns for Neonatal Abstinence Syndrome**, 2006-2017**

Neonatal Abstinence Syndrome	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Neonatal Abstinence Syndrome inpatient discharges	305	369	477	715	953	1172	1482	1717	1919	2174	2223	1935
Medicaid Discharge	222	288	369	583	811	998	1322	1502	1741	1950	1986	1753
Non-Medicaid Discharge	83	81	108	132	142	174	160	215	178	224	237	182
Average length of days (LOS) in days	16	19.5	20.1	19.6	18.9	16.37	17.73	15.19	14.9	13.9	12.9	13.41
Total LOS (days)	4,892	7,200	9,580	14,006	17,965	19,181	21,834	26,085	28,580	30,153	28,656	25,954
Average charge***	\$39,561	\$59,033	\$59,580	\$72,158	\$64,911	\$59,847	\$57,813	\$61,469	\$68,666	\$61,241	\$61,598	\$65,127
Total charge***	\$12,066,087	\$20,982,542	\$28,419,546	\$51,592,956	\$61,860,258	\$70,140,821	\$85,678,946	\$105,542,816	\$131,770,486	\$133,138,341	\$136,932,674	\$126,020,134

*Hospitalizations occurred in Ohio hospitals to Ohio residents

**NAS reflects ICD-9 CM code 779.5 for 2006 - 9/30/2015 and ICD-10-CM code P96.1 for 10/01/2015 - 2016 (NAS Could be in primary or 18 secondary dx fields)

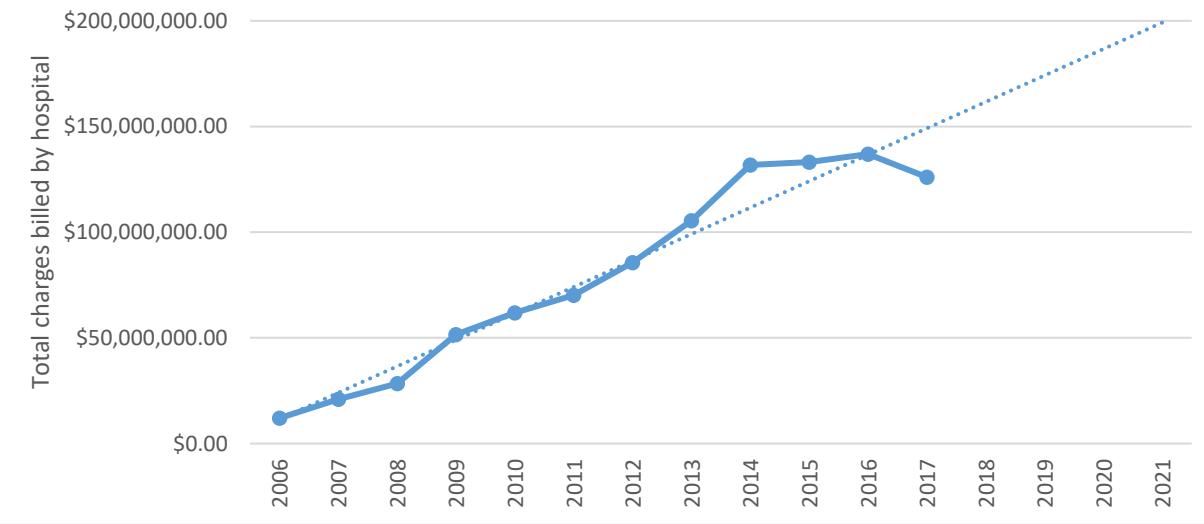
***Charges reflect charges billed by the hospital

Table 2: Births* to Ohio Residents in Ohio Hospitals, 2006-2017

Hospital Births	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Hospital births inpatient discharges	152,740	151,454	148,800	146,226	139,987	137,168	139,517	140,034	140,658	140,142	138,267	
Medicaid Discharge	60,976	59,830	61,461	65,062	63,710	62,429	67,364	65,415	67,308	67,009	63,792	64,808
Non-Medicaid Discharge	91,764	91,624	87,339	81,164	76,277	74,739	72,153	74,619	73,348	73,649	76,350	73,459
Average LOS (days)	3.4	3.5	3.5	3.6	3.6	3.6	3.8	3.7	3.7	3.7	3.7	3.8
Average charge**	\$6,838	\$7,870	\$8,660	\$9,680	\$10,336	\$11,452	\$12,977	\$13,604	\$14,570	\$15,494	\$16,695	\$17,812

*Hospital births reflect MSDRG codes 789-795 (Neonates and Newborns)

**Charges reflect charges billed by the hospital

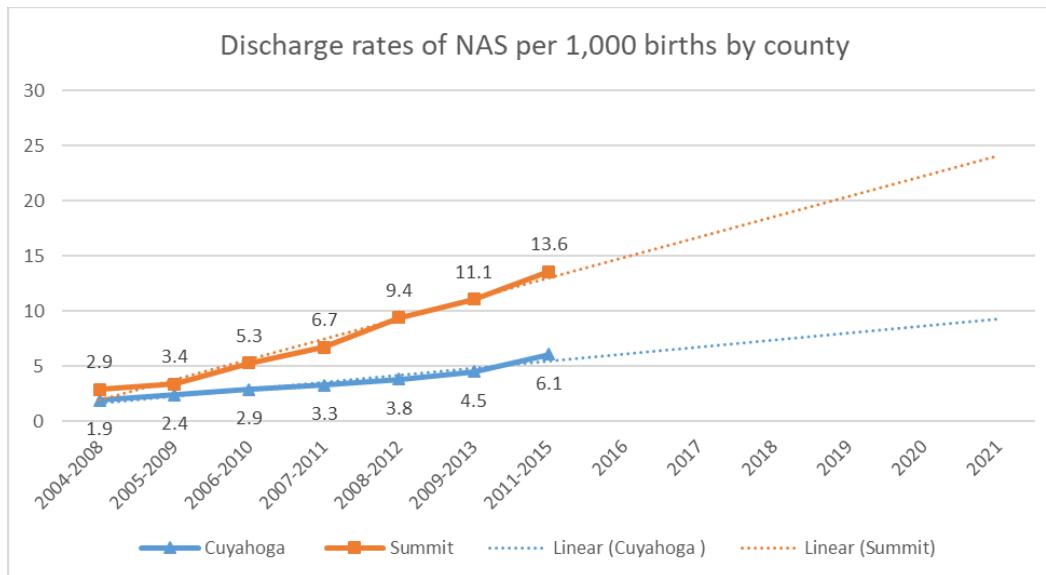
Inpatient hospitalization charges for infants with NAS in OH

43. Inpatient hospitalization for NAS infants corresponds to costly hospital expenditures – many of which are often shouldered by state Medicaid programs.

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2. The Rates of NAS in Cuyahoga and Summit Counties

44. In Cuyahoga County for the year 2017 there were 137 infants diagnosed with NAS, and in Summit County there were 71 infants. For the five-year period of 2013-2017, a total of 629 infants in Cuyahoga County and 426 infants in Summit County were diagnosed with NAS. Summit County is projected to have more than 2% of all births with the diagnosis of NAS by 2020.⁵⁷



3. Standard Treatments and Interventions for NAS

45. Babies born to mothers who use or are addicted to opioids need particular care and attention. By improving and standardizing the care these babies receive, OPQC expects to reduce the length of hospital stay for newborns and improve outcomes at discharge.
46. Given the underreporting of maternal drug use, traditional risk-based screening methods may not identify all newborns at risk for NAS and therefore underestimate in utero opioid exposure.^{58,59} Universal maternal drug testing improves the identification of infants at risk for the development of NAS. After adoption of universal maternal testing, the Cincinnati region has had a decrease in need for pharmacologic treatment for opioid-exposed infants

⁵⁷ *Ibid.*

⁵⁸ Wexelblatt, *The Journal of Pediatrics* (2015).

⁵⁹ Hall ES, Wexelblatt SL, Greenberg JM. Self-reported and Laboratory Evaluation of Late Pregnancy Nicotine Exposure and Drugs of Abuse. *Journal of Perinatology : Official Journal of the California Perinatal Association*. 2016;36(10):814-818.

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to 30% (unpublished data CCHMC NAS Task Force), compared to a statewide level of 42%.⁶⁰

47. There is no nationally recognized protocol for treatment, leading to substantial variation in practice, degree of opioid exposure and hospital length of stay. Through our statewide collaborations of OCHA and OPQC, we have created a standardized protocol to safely decrease the length of stay.⁶¹

- (1) All infants are scored every 3-4 hours around feedings with the modified Finnegan Scoring System. This scoring tool is performed by nurses and addresses 21 different components.
- (2) Nonpharmacologic treatment measures, including swaddling, skin-to-skin care, rooming in, and reduced stimulation are recommended.^{62,63}
- (3) Pharmacologic treatment support with opioids, such as morphine or methadone, has been shown to be the best treatment when medication is needed.^{64,65,66} Initiation of medication is done based on worsening withdrawal despite nonpharmacologic interventions. The updated protocol is attached as **Exhibit B** to this report.⁶⁷

48. Per OPQC data, the average overall length of stay for the 9,648 opioid exposed infants was 8.6 days during the period of 2014-2018. The proportion of infants requiring

⁶⁰ Ohio Perinatal Quality C. OPQC Neonatal Abstinence Syndrome Project. 2018; <https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/NAS/AP%20Calls/OPQC%20NAS%20Sustain%206.19.18.pdf>

⁶¹ Hall, *Pediatrics* (2014); Hall, *Pediatrics* (2015); Walsh, *Pediatrics* (2018)

⁶² Holmes AV, Atwood EC, Whalen B, et al. Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. *Pediatrics*. 2016;137(6).

⁶³ Howard MB, Schiff DM, Penwill N, et al. Impact of Parental Presence at Infants' Bedside on Neonatal Abstinence Syndrome. *Hospital Pediatrics*. 2017;7(2):63-69.

⁶⁴ Wexelblatt SL, McAllister JM, Nathan AT, Hall ES. Opioid Neonatal Abstinence Syndrome: An Overview. *Clinical pharmacology and therapeutics*. 2018;103(6):979-981.

⁶⁵ Kraft WK, Stover MW, Davis JM. Neonatal abstinence syndrome: Pharmacologic strategies for the mother and infant. *Seminars in perinatology*. 2016;40(3):203-212.

⁶⁶ Disher T, Gullickson C, Singh B, et al. Pharmacological Treatments for Neonatal Abstinence Syndrome: A Systematic Review and Network Meta-analysis. *JAMA Pediatr*. 2019.

⁶⁷ Ohio Perinatal Quality C. OPQC Recommended NAS Protocol Changes 2017. 2017. Available at <https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/NAS/OPQC%20Recommended%20NAS%20Protocol%20Changes%202017.pdf>

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pharmacologic treatment declined 6% from 48% to 42%, (about 134 infants/year statewide). For infants requiring pharmacologic treatment, the days of opioid treatment declined from 14.6 to 12.2 days, and length of stay declined from 18.2 to 16.2 days.⁶⁸

49. There are lasting effects on children diagnosed with NAS. Infants with opioid exposures are more likely than infants with no drug exposures to be diagnosed with: behavioral or emotional disorders, developmental delay, lower developmental scores, speech disorder, strabismus, increased incidence of torticollis and associated plagiocephaly, and more likely to be exposed to the hepatitis C virus.^{69,70}
50. Closer follow up is needed for opioid exposed infants compared to non-exposed due to the potential long-term complications stated above.⁷¹
51. Continued observation of opioid-effected children will be important in order to ensure optimal outcomes among this population, particularly given the potential that delays observed at two years of age may predict later learning disabilities or increased risk of addiction.⁷² Early intervention has been shown to help in childhood,⁷³ and should be provided to those infants with a NAS diagnosis.

4. Long-Term Care for Children and Families Impacted by Opioids

52. There are several emerging models for the long-term care of children and families impacted by opioids. Models providing family-centered care, comprehensive pediatric care, and developmental follow-up have all been demonstrated to improve outcomes.
53. Family-centered care involves providing direct pediatric care to opioid-exposed children, as well as direct medical and addiction care for parents in recovery. Such care can provide

⁶⁸ Ohio Perinatal Quality C. OPQC Neonatal Abstinence Syndrome Project. 2018. Available at https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/NAS/AP%20Calls/OPQC%20NAS%20Sustain%206_19.18.pdf.

⁶⁹ McAllister JM, Hall ES, Hertenstein GER, Merhar SL, Uebel PL, Wexelblatt SL. Torticollis in Infants with a History of Neonatal Abstinence Syndrome. *The Journal of Pediatrics*. 2018;196:305-308.

⁷⁰ Merhar SL, McAllister JM, Wedig-Stevie KE, Klein AC, Meinzen-Derr J, Poindexter BB. Retrospective review of neurodevelopmental outcomes in infants treated for neonatal abstinence syndrome. *Journal of Perinatology : Official Journal of the California Perinatal Association*. 2018;38(5):587-592.

⁷¹ McAllister, *Journal of Pediatrics* (2018); Merhar, *J of Cal. Perinatal Asso.* (2018).

⁷² Health ODo. 2017 Ohio Neonatal Abstinence Syndrome Report. 2018; https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/media/2017_nas_county_table

⁷³ Cannon JS, Kilburn MR, Karoly LA, Mattox T, Muchow AN, Buenaventura M. Investing Early: Taking Stock of Outcomes and Economic Returns from Early Childhood Programs. *Rand Health Q*. 2018;7(4):6.

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a continuum of interdisciplinary services integrated with primary health care. Potential services may include home visiting, case management, child developmental monitoring, speech and language, physical therapy, and occupational therapy, infant mental health services, referrals to legal services, and community referrals. Residential care for pregnant women with substance use disorders is another important component of family-centered care. Women may be able to stay at the residential facilities postpartum in order to continue to receive supportive services.

54. Comprehensive pediatric care programs provide multidisciplinary, long-term care for all pediatric needs, with possible links to adult care for parents. These programs seek to provide comprehensive long-term pediatric care from birth to adulthood.
55. Pediatric developmental follow-up programs provide longitudinal developmental assessment and support while pediatric primary care and other care takes place elsewhere.

5. Current Ohio Initiatives Relating to NAS

56. In response to the growing rates of NAS, Ohio implemented and tested models of care for pregnant women with opioid use disorder through a project known as Maternal Opiate Medical Supports (MOMS).
57. Compared to the Medicaid comparison cohort, MOMP pilot site participants: received more prenatal care visits; received more behavioral health services during pregnancy and after delivery; had fewer foster care placements and fewer cases of substantiated or indicated abuse and neglect.⁷⁴
58. In collaboration with the Ohio Department of Mental Health and Addiction Services (ODHMAS), the Ohio Department of Medicaid (ODM), and the Ohio Department of Health (ODH), OPQC has built on the initial MOMP project through its MOMP+ initiative. Through MOMP+, OPQC aims to optimize the maternity medical home and to improve outcomes for pregnant women with opioid use disorder and their infants.
59. The goal of MOMP+ is to improve care and outcomes by supporting maternity care providers in the care of pregnant women with opioid use disorder, working closely with those who provide medication assisted treatment and behavioral health therapy.
60. The Cincinnati Children's Hospital provides a pediatric developmental follow-up program to substance-exposed infants in the region through its Neonatal Abstinence Syndrome

⁷⁴ Presentation by Michele Walsh, MD and Michael Marcotte, MD, IHI National Forum Presentation, December 11, 2018. Available at http://app.ihi.org/FacultyDocuments/Events/Event-3135/Presentation-17169/Document-14004/Presentation_C5_Improve_Outcomes_for_Moms_and_Babies_Marcotte.pdf

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Clinic (“NAS Clinic). The NAS Clinic is one of the few clinics in the nation that follows substance-exposed infants over time. The Hospital’s NAS Clinic provides developmental screening, occupational and physical therapy, and education about nutrition and feeding to substance-exposed infants up to the age of two years old. The clinic is staffed by physicians, neonatal nurse practitioners, nurses, nutritionists, social workers, occupational therapists, speech therapists, and physical therapists, who provide multidisciplinary care during infants’ regular visits with their physicians. A social worker also meets with patients during clinic visits, addressing broad social needs including those of children in foster care placement. Children receive vision screens at six to eight months of age. Hepatitis C testing is done for infants with prenatal exposure to the virus. The NAS team also provides outreach and education in groups to mothers during pregnancy and postpartum.

IV. RECOMMENDATIONS FOR IMPROVING OUTCOMES

As set forth above, it is my opinion that the increasing number of women with opioid use disorder in Cuyahoga and Summit Counties, as well as growing incidence of NAS, is a significant public health issue. In order to address this urgent issue and improve outcomes, the Counties should develop and enhance multidisciplinary programs and services for early intervention, prevention, and support. Women with opioid use disorder need intensive support during their pregnancy, delivery and postpartum period. Infants diagnosed with NAS need treatment to wean them off of opioids and continuing care to minimize lasting effects. It is my professional opinion that the programs and interventions suggested below would help to reduce opioid use among women who are or will become pregnant, reduce foster placements, and reduce the risk of potential harms to infants and children:

A. Prevention

- ✓ Create and/or support programming within opioid maintenance clinics that is designed to delay pregnancy until a prospective mother’s health and dependence are improved;
- ✓ Educate women of childbearing age about substance abuse prevention;
- ✓ Establish community referral sources and services for pregnant women who are diagnosed with opioid use disorder and/or overdose including emergency rooms, women health clinics, community drug treatment centers among others;
- ✓ Provide counseling for women of childbearing age being treated for substance abuse or dependence on the impact of substance use on pregnancy;
- ✓ Implement the use of standardized screening tools early in prenatal care;
- ✓ Implement programs to improve and expand screening to identify women in need of intervention and treatment referral;

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- ✓ Screen for substance abuse as part of a comprehensive obstetric care plan at first prenatal visit in partnership with the pregnant woman to identify infants at risk for the development of NAS;
- ✓ Create public education campaigns to raise awareness of the health effects of opioid use prior to and during pregnancy;
- ✓ Invest resources in public education campaigns that aim to reduce barriers for women seeking treatment prior to conception and/or in early pregnancy by encouraging women to seek prenatal care and avoiding criminalizing pregnant women with opioid addiction.

B. Education and Training

- ✓ Educate physicians and nurses who treat women about the signs of addiction and utilize standardized screening tools for at-risk women;
- ✓ Enhance training for providers caring for pregnant women with opioid use disorders to understand the complexity of the woman's social, mental and physical problems ;
- ✓ Provide medical providers with training and need for screening tools early in prenatal care in order to identify pregnant women in need of treatment and/or other supportive services.

C. Supportive Services and Interventions

- ✓ Expand existing MAT treatment programs and develop supportive services to mitigate potential barriers to these services including program availability, capacity, and transportation;
- ✓ Develop programs that provide coordinated services between MAT providers, perinatal healthcare providers, and specialists in addiction medicine, behavioral health, and social services;
- ✓ Eliminate barriers to buprenorphine replacement therapy during pregnancy, which can decrease the severity of newborn withdrawal, allowing certified providers to increase the number of patients they are treating;
- ✓ Provide intensive support to mothers during pregnancy, delivery, and postpartum period. Including outpatient program for pregnant women with an available overnight housing unit providing substance abuse treatment, psychiatry, medical treatment and family planning;
- ✓ Implement coordinated care and connect mothers with outpatient support and treatment programs prior to discharge;
- ✓ Provide postpartum long-term addiction care;

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- ✓ Provide aftercare services so mothers can cope with their addiction and learn about the special needs of their infants;
- ✓ Create additional residential treatment facilities for both the mother and infant;
- ✓ Provide family based care to opioid exposed children as well as direct care for parents in recovery or maintenance;
- ✓ Ensure nurseries develop standardized evidence-based policies to assess and treat infants with NAS;
- ✓ Provide support to families to improve the outcomes for infants with NAS through breastfeeding, visits, and other support;
- ✓ Create pediatric developmental follow-up programs for opioid exposed infants.

V. DISCLOSURES AND RESERVATION OF RIGHTS

61. This report contains a true and accurate statement of my opinions in this matter. The matters cited in this expert report are based on my personal knowledge, education, and years of industry experience and, if called to testify, I will testify to the same effect.
62. This report is a statement of opinions I expect to express in this matter and the basis and reasons for those opinions. This report summarizes only my current opinions and analyses to date, which are subject to change depending upon ongoing discovery and additional information. I respectfully reserve the right to supplement my report in light of this and any other additional fact discovery, opinions by other experts, and/or trial testimony. I also respectfully reserve the right to provide rebuttal opinions and testimony in response to other experts, and rebuttal testimony in response to any fact witnesses. In connection with my anticipated trial testimony in this action, I may use as exhibits various documents produced in this litigation that refer to or relate to the matters discussed in this report. In addition, I respectfully reserve the right to use animations, demonstratives, enlargements of actual attachments, and other information in order to convey my opinions.
63. I understand that I may be asked to provide further opinions and analyses on other issues, including in response to analyses provided by other experts. I will do so at the appropriate time set by the Court.
64. The opinions in the report are stated to a reasonable degree of medical certainty in the field of the pediatrics and maternal-fetal issues as they relate to exposure and impact of in utero opioid exposure to infants.

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Executed on this 25th day of March, 2019, in Mason, Ohio.

A handwritten signature in black ink, appearing to read "Scott Wexelblatt". It is written in a cursive style with a horizontal line underneath it.

Scott Wexelblatt M.D.

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IN RE: NATIONAL PRESCRIPTION OPIATE LITIGATION-MDL No. 2804

SCOTT L. WEXELBLATT, MD EXPERT REPORT

MARCH 25, 2019

Confidential**TABLE OF CONTENTS**

I.	BACKGROUND AND QUALIFICATIONS	3
II.	BRIEF SUMMARY OF OPINIONS	5
III.	BASIS FOR OPINIONS	7
A.	Opioid Use in the United States and Ohio	7
B.	Rates of Opioid Exposure Among Women in the US and Ohio.....	8
C.	Guidelines and Interventions for Pregnant Women with Opioid Use Disorder ...	12
D.	Neonatal Abstinence Syndrome.....	14
1.	The Rapidly Increasing Rate of NAS in Ohio	16
2.	The Rates of NAS in Cuyahoga and Summit Counties	18
3.	Standard Treatments and Interventions for NAS	18
4.	Long-Term Care for Children and Families Impacted by Opioids	20
5.	Current Ohio Initiatives Relating to NAS.....	21
IV.	RECOMMENDATIONS FOR IMPROVING OUTCOMES	22
A.	Prevention	22
B.	Education and Training.....	23
C.	Supportive Services and Interventions.....	23
V.	DISCLOSURES AND RESERVATION OF RIGHTS.....	24

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I. BACKGROUND AND QUALIFICATIONS

1. My name is Scott L. Wexelblatt, MD. I am the Regional Medical Director of Newborn Services at Cincinnati Children's Hospital Medical Center and an Associate Professor in the Department of Pediatrics, University of Cincinnati College of Medicine.
2. I have been asked to provide an expert opinion on the effects of opioid addiction on pregnant mothers and infants with a focus on neonatal abstinence syndrome (NAS) and its impact on Cuyahoga and Summit Counties (collectively, “the Counties”).
3. I am a pediatrician and researcher focused on improving perinatal health outcomes in regional populations. I am currently the Regional Director of Newborn Services for Cincinnati Children's Hospital Medical Center (CCHMC) Perinatal Institute, which serves eight level 2 hospitals and three level 1 nurseries in our region.
4. I am a faculty member of Ohio Perinatal Quality Collaborative (OPQC) on the Neonatal Abstinence Syndrome project. OPQC is a statewide consortium of perinatal clinicians, hospitals, policymakers and governmental entities that aims, through the use of improvement science, to reduce preterm births and to improve perinatal and birth outcomes in Ohio. OPQC has been working in collaboration with the Ohio Department of Mental Health and Addiction Services (ODHMAS), the Ohio Department of Medicaid (ODM), and the Ohio Department of Health (ODH) to improve outcomes for pregnant women with opioid use disorder and their infants.
5. As the regional faculty representative for the Ohio Children's Hospital Association (OCHA) subcommittee on neonatal abstinence syndrome, I helped establish a protocol for NAS for twenty Ohio children's and maternity hospitals.¹ I led the data analysis and was a co-first author on a publication of key findings from OCHA. OCHA's findings showed improved outcomes following an infant's in utero exposure to opioids through the utilization of standard treatment protocols with stringent weaning guidelines.²
6. Based on our primary findings, I helped establish a standardized protocol for NAS, and spread this new protocol to hospitals to implement. I was the co-author and led the data analysis on our publication showing marked improvement with implementation of this protocol.³

¹ Hall ES, Wexelblatt SL, Crowley M, et al. A Multicenter Cohort Study of Treatments and Hospital Outcomes in Neonatal Abstinence Syndrome. *Pediatrics*. 2014;134(2):e527-534. Six hospitals' neonatology groups covered newborn nurseries in twenty hospitals. The six hospitals included Rainbow Babies and Children's Hospital (Cleveland); Akron Children's Hospital; Cincinnati Children's Hospital; Dayton Children's Hospital; Nationwide Children's Hospital (Columbus); ProMedical Toledo Children's Hospital.

² *Ibid.*

³ Hall ES, Wexelblatt SL, Crowley M, et al. Implementation of a Neonatal Abstinence Syndrome Weaning Protocol: A Multicenter Cohort Study. *Pediatrics*. 2015;136(4):e803-810.

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7. Building upon my work with the OCHA collaborative, I served as a primary or co-investigator in several additional regional analyses designed to provide evidence for further optimizing NAS guidelines.⁴ Analyses of outcomes following methadone versus buprenorphine weaning and a comparative effectiveness evaluation of conventional methadone weaning versus weaning with a pharmacokinetic modeled methadone protocol were published.^{5,6}
8. Through my role as a faculty member of the OPQC, I am currently participating in disseminating the OPCQ's findings to 52 delivery hospitals in Ohio to improve the care of the opioid-exposed infant. Through our statewide collaborations of OCHA and OPQC, we have created a standardized protocol to safely decrease the length of hospital stay.⁷
9. In my role as Regional Director of Newborn Care, I led the implementation of universal maternal testing in 18 hospitals in Southwest Ohio after demonstrating in a pilot study that universal testing was superior to the risk-based screen which was being utilized at that time. This has led to earlier identification and diagnosis of opioid exposed neonates, leading to improved hospital care, and an improved discharge care plan and follow up.⁸
10. I received a B.A. *cum laude* from the University of Delaware (Psychology) in 1992 and an M.D. from University of Vermont College of Medicine in 1996. I completed postgraduate training, pediatric residency and internship at the Cincinnati Children's Hospital Medical Center (1996-1999).
11. I am licensed to practice medicine in the State of Ohio and Board Certified by the American Board of Pediatrics (1999 with recertifications in 2007 and 2015).
12. My curriculum vitae, a copy of which is attached as **Exhibit A**, further describes my education, background, and qualifications. In addition, it lists those matters in which I have testified as an expert at trial or deposition within the past four years.

⁴ Walsh MC, Crowley M, Wexelblatt S, et al. Ohio Perinatal Quality Collaborative Improves Care of Neonatal Narcotic Abstinence Syndrome. *Pediatrics*. 2018;141(4).

⁵ Hall ES, Rice WR, Folger AT, Wexelblatt SL. Comparison of Neonatal Abstinence Syndrome Treatment with Sublingual Buprenorphine versus Conventional Opioids. *American Journal of Perinatology*. 2018;35(4):405-412.

⁶ Hall ES, Iseemann BT, Wexelblatt SL, et al. A Cohort Comparison of Buprenorphine versus Methadone Treatment for Neonatal Abstinence Syndrome. *The Journal of Pediatrics*. 2016;170:39-44 e31.

⁷ Hall, *Pediatrics* (2015)

⁸ Wexelblatt SL, Ward LP, Torok K, Tisdale E, Meinzen-Derr JK, Greenberg JM, Universal Maternal Drug Testing in a High-Prevalence Region of Prescription Opiate Abuse. *The Journal of Pediatrics*, 2015, 166 (3); 582-586.

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13. I have authored or coauthored numerous publications, the title and citations of which are also listed on **Exhibit A**. This list includes publications I have authored or co-authored in the last ten years.
14. I am being compensated at a rate of \$650 per hour for my services in this litigation. I am also being reimbursed for all reasonable expenses incurred for my work on this litigation. No part of my compensation is contingent upon the outcome of this litigation, and I have no interest in the litigation or with either party.

II. BRIEF SUMMARY OF OPINIONS

15. Based upon my qualifications, experiences and research, as well as the information referenced in this report, I plan to offer the opinions set forth below. This report draws upon my professional experiences, research and participation in studies as outlined in my qualifications relating to opioid exposed infants, a literature search of scientific publications and publications from authoritative sources such as the Center for Disease Control (CDC), the Substance Abuse and Mental Health Services Administration (SAMSHA), the American College of Obstetricians and Gynecologists (ACOG), World Health Organization (WHO), Ohio Department of Mental Health and Addiction Services (ODHMAS), Ohio Department of Health (ODH), Ohio Department of Medicaid (ODM), and the Ohio Perinatal Quality Collaborative (OPQC).
 - a. The use and exposure of opioids among pregnant women continues to grow throughout the United States.
 - b. Neonatal abstinence syndrome (NAS) is a clinical diagnosis given to infants who experience withdrawal signs and symptoms after in utero exposure to opioids.
 - c. Withdrawal signs develop in 55% to 94% of opioid exposed infants, with 30-65% of those infants requiring pharmacologic treatment for severe withdrawal.
 - d. The increasing number of women with opioid use disorder in Cuyahoga and Summit Counties and the growing incidence of NAS, is a significant public health issue. The Counties will need to build upon existing programs and develop new multidisciplinary programs to improve the outcomes of women with opioid use disorder, mothers, and infants. As the rate of infants born with NAS continues to climb, additional and enhanced services are needed in Cuyahoga and Summit Counties, including programs focused on prevention, treatment, and early intervention.
 - e. Preventing opioid exposure among women of childbearing age and pregnant women will greatly reduce the number of babies with narcotic exposure and reduce the need for treatment of NAS.
 - f. Effective prevention programs will need to educate women of childbearing age about substance abuse prevention and raise awareness of the effects of opioid use

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prior to and during pregnancy, and provide counseling for women being treated for opioid use disorder.

- g. Emergency rooms, health clinics, community drug treatment centers, and other service providers should expand screening programs in order to identify women in need of intervention and treatment referral.
- h. Any programs geared towards prevention and/or treatment must recognize barriers to treatment for women during pregnancy, delivery and postpartum.
- i. Standardized NAS assessment and treatment protocols improve outcomes for care for opioid-exposed infants in Ohio.
- j. Universal maternal screening prenatally and testing at the time of delivery improves the identification of infants at risk for the development of NAS.
- k. Pharmacological support with opioids has been shown to be the best treatment when medication is needed for withdrawal for babies with NAS.
- l. Existing medication assisted treatment (MAT) programs should be expanded, along with coordinated supportive services that mitigate barriers women may experience in accessing these treatment.
- m. Access to buprenorphine replacement therapy, which can decrease the severity of newborn withdrawal, should be expanded.
- n. Continued study on long terms outcomes and personalized pharmacological treatment are important for the optimization of outcomes for opioid-affected babies.
- o. The effective long-term care of children and families impacted by opioids will require programs that provide: family-centered care, such as residential care for pregnant and postpartum women with opioid use disorder; comprehensive pediatric care, such as regular preventative care for children; and developmental follow-up programs for children, which may include regular developmental screening, occupational therapy, and physical therapy.
- p. It is my opinion that an optimal maternal care program would allow women with opioid use disorders to be identified during pregnancy and subsequently provided with prenatal care and other supportive services. The program would provide for the development of an individualized treatment care plan for both mother and baby, as well as a discharge plan with home visitation, early intervention services, and referrals to other supportive services. Care would be coordinated through an interdisciplinary team that may include specialists in perinatology, neonatology, addiction medicine, psychiatry, social work, case management, and nutrition. Referrals to the program would come from throughout the community, including emergency departments, obstetric triage, women's health centers, family medicine

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providers, addiction medicine providers, community drug treatment centers, and hospitals.

III. BASIS FOR OPINIONS

A. Opioid Use in the United States and Ohio

16. The use of opioids has escalated throughout the United States resulting in an epidemic of opioid misuse, overdose, and death. As a consequence, there are more than 131 opioid overdose deaths in the United States each day.⁹
17. As of 2017, overdose deaths involving prescription opioids were five times higher than they were in 1999.¹⁰ In addition to overdose deaths, the Center for Disease Control and Prevention (CDC) reports that “nonfatal overdoses from both prescription and illicit drugs are responsible for increasing emergency department visits and hospital admissions.”¹¹
18. Ohio has been recognized as among the top five states with the highest rates of opioid related overdose deaths.¹² According to the Ohio Department of Health, “from 2000 to 2017, Ohio’s death rate due to unintentional drug poisonings increased 1,081 percent, and the increase in deaths has been driven largely by opioid-related overdoses.”¹³ In 2016, Ohio had a rate of 32.9 opioid-related overdose deaths per 100,000 persons – more than double the national average.¹⁴

⁹ U.S. Department of Health and Human Services (HHS), Office of the Surgeon General, *Facing Addiction in America: The Surgeon General’s Spotlight on Opioids*. Washington, DC: HHS, September 2018.

¹⁰ Centers for Disease Control and Prevention (CDC). 2018 Annual Surveillance Report of Drug-Related Risks and Outcomes — United States. Surveillance Special Report. Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. Published August 31, 2018. Available at <https://www.cdc.gov/drugoverdose/pdf/pubs/2018-cdc-drug-surveillance-report.pdf>.

¹¹ *Ibid.*

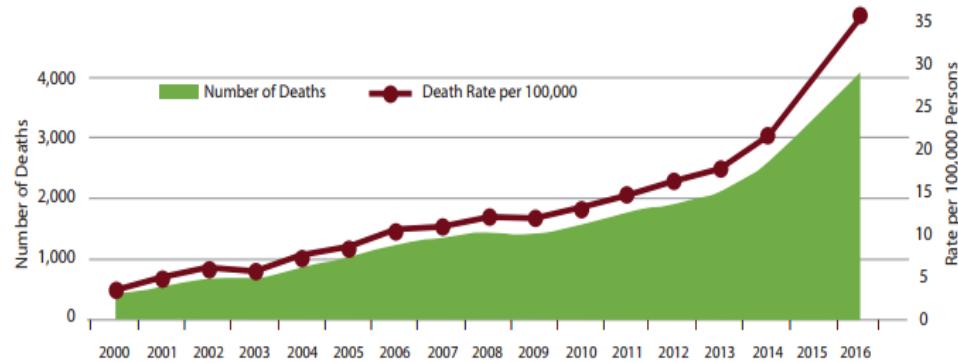
¹² National Institute on Drug Abuse (NIDA), *Opioid-Related Overdose Deaths: Ohio*, February 2018. Available at <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-summaries-by-state/ohio-opioid-summary>.

¹³ Ohio Department of Health, *Drug Overdose*, July 2, 2018. Available at <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/Drug-overdose/>.

¹⁴ NIDA 2018

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Figure 8. Number of Deaths and Annual Age-Adjusted Death Rate* per 100,000 Population from Unintentional Drug Overdose by Year, Ohio Residents, 2000-2016

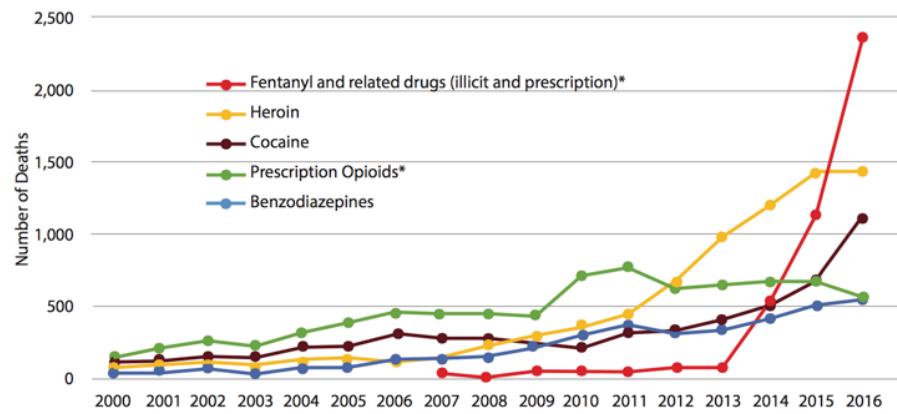


Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.

*The death rate is presented as age-adjusted which allows a comparison of death rates between populations (e.g. counties and states). The rates are adjusted to the U.S. 2000 standard population to allow a comparison of the overall risk of dying between different populations.

Unintentional Overdoses Involving Select Drugs and Age-Adjusted Death Rate

Figure 7. Number of Unintentional Drug Overdose Deaths Involving Selected Drugs, by Year, Ohio, 2000-2016



Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.

Multiple drugs are usually involved in overdose deaths. Individual deaths may be reported in more than one category.

Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

* Excludes deaths involving fentanyl and related drugs.

B. Rates of Opioid Exposure Among Women in the US and Ohio

19. Opioid use among women has increased dramatically.¹⁵

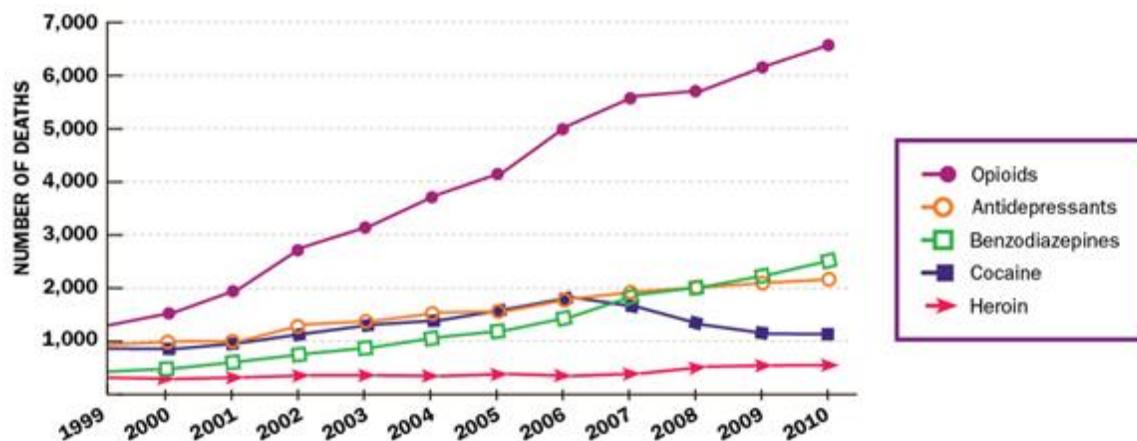
¹⁵ American Society of Addiction Medicine (ASAM), *Opioid Addiction, 2016 Facts and Figures*. Available at <https://www.asam.org/docs/default-source/advocacy/opioid-addiction-disease-facts-figures.pdf>.

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20. In 2013, the CDC highlighted the growing epidemic of prescription opioid overdoses among women, finding:

- About 18 women die every day of a prescription painkiller overdose in the U.S., more than 6,600 deaths in 2010;
- Prescription painkiller overdoses are an under-recognized and growing problem for women;
- Between 1999 and 2010, overdose deaths from prescription painkillers increased more than 400% among women, compared to an increase of 237% among men;
- Between 2002 and 2013, heroin use among women increased 100% compared to an increase of 50% among men;
- Nearly 48,000 women died of prescription painkiller overdoses between 1999 and 2010;
- For every one woman who dies of a prescription painkiller, thirty go to the emergency room for painkiller misuse or abuse.
- Every three minutes, a woman goes to the emergency department for prescription painkiller misuse or abuse;
- Women between the ages of 25 and 54 are most likely to go to the emergency department because of prescription painkiller misuse or abuse.¹⁶

Prescription painkiller overdose deaths are a growing problem among women.



¹⁶ CDC, *Vital Signs* (2013)

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SOURCE: National Vital Statistics System, 1999-2010 (deaths include suicides)

Drug overdose deaths among women, by select drug class, United States, 2004-2010. Data from National Vital Statistics System

21. Between 2000 and 2009, maternal antepartum opioid use increased from 1.19 to 5.63 per 1000 hospital births annually.¹⁷ Between 2005 and 2011, more than 14% of pregnant women were legally dispensed an opioid at some time during pregnancy.¹⁸
22. By 2011, more than 1% of pregnant women used opioid-based pain relievers or heroin illicitly.¹⁹ By 2012, 27.7% of privately insured and 39.4% of Medicaid insured-women of reproductive age filled prescriptions for opioid medications.²⁰
23. According to the CDC, women are more likely to experience chronic pain and use prescription opioid pain medications for longer periods and in higher doses than men.²¹ Studies have also shown that women who use opioids progress to dependence more quickly than men and experience more cravings than men;²² that psychological and emotional distress are identified as risk factors for hazardous opioid prescription use among women but not men;²³ and that women who are caregivers may face additional barriers to treatment for substance abuse disorder such as lack of childcare.²⁴

¹⁷ Patrick SW, Schumacher RE, Benneyworth BD, Krans EE, McAllister JM, Davis MM. Neonatal Abstinence Syndrome and Associated Health Care Expenditures: United States, 2000-2009. *JAMA : the Journal of the American Medical Association*. 2012;307(18):1934-1940.

¹⁸ Bateman, BT, et al, Patterns of Opioid Utilization in Pregnancy in a Large Cohort of Commercial Insurance Beneficiaries in the United States. *Anesthesiology*. 2014;120(5): 1216-1224

¹⁹ Hall, *Pediatrics* (2016).

²⁰ Ailes EC, Dawson AD, Lind JN, Gilboa SM, Frey MT, Broussard CS, and Honein MA. CDC. Opioid Prescription Claims Among Women of Reproductive Age – United States, 2008-2012. *MMWR*. 2015 Jan 23;64(2):37-41.

²¹ Centers for Disease Control and Prevention. Prescription Painkiller Overdoses. *Vital Signs*. July 2013. Available at <http://www.cdc.gov/vitalsigns/prescriptionpainkilleroverdoses/index.html>.

²² Back SE, Payne RL, Wahlquist AH, et al. Comparative Profiles of Men and Women with Opioid Dependence: Results from a National Multisite Effectiveness Trial. *The American Journal of Drug and Alcohol Abuse*. 2011;37(5):313-323.

²³ Back, SE, Lawson, K, Singleton, L, and Brady, KT. Characteristics and Correlates of Men and Women with Prescription Opioid Dependence. *Addict Behav*. 2011; August; 36(8): 829-834.

²⁴ Center for Substance Abuse Treatment. Substance Abuse Treatment: Addressing the Specific Needs of Women: Treatment Improvement Protocol (TIP) series 51; vol HHS publication no. (SMA) 09-4426. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2009

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24. Unintended pregnancy rates among women with substance abuse disorders are approximately 80 percent, considerably higher than the rate of unintended pregnancies in the general population.²⁵ According to guidance issued by the Substance Abuse and Mental Health Services Administration (SAMSHA) concerning the treatment of pregnant and parenting women with opioid use disorder, “preventing unintended pregnancies and planning for future pregnancies is critical.”²⁶ SAMSHA recommends that healthcare professions should offer women with opioid use disorder “non-coercive contraception counseling” for prior to leaving the hospital.²⁷
25. Opioid use during pregnancy has increased dramatically in recent years as a growing number of women of childbearing age suffer from opioid use disorder.²⁸ In Ohio, over 4,200 pregnant women were admitted to treatment between 2004 and 2011.²⁹
26. Increases in opioid use among pregnant women includes increases in the use of prescription opioids, medication assisted treatment, increases in illicit drug use.³⁰ Studies have shown substance use during pregnancy to be a ubiquitous problem affecting women across racial, socioeconomic status, and age categories.³¹
27. The increase in utilization of opioids by women of reproductive age and pregnant women is particularly concerning because of the potential effects both on the women and their unborn children.

²⁵ The American College of Obstetricians and Gynecologists. ACOG Committee Opinion, Number 711. Opioid use and opioid use disorder in pregnancy. Available at <https://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Opioid-Use-and-Opioid-Use-Disorder-in-Pregnancy>. Published August 2017.

²⁶ Substance Abuse and Mental Health Services Administration. *Clinical Guidance for Treating Pregnant and Parenting Women with Opioid Use Disorder and Their Infants*. HHS Publication NO. (SMA) 18-5054. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2018.

²⁷ *Ibid.*

²⁸ Haight SC, Ko JY, Tong VT, Bohm MK, Callaghan WM. Opioid Use Disorder Documented at Delivery Hospitalization — United States, 1999–2014. *MMWR Morb Mortal Wkly Rep.* 2018;67:845–849. DOI: <http://dx.doi.org/10.15585/mmwr.mm6731a1>.

²⁹ Massatti, R., Falb, M., Yors., Potts, L., Beghly, C. & Starr, S., (2013, November) Neonatal abstinence syndrome and drug use among pregnant women in Ohio, 2004-2011. Columbus, OH: Ohio Department of Mental Health and Addiction Services.

³⁰ Reddy, U. M., Davis, J. M., Ren, Z., & Greene, M. F. (2017). Opioid use in pregnancy, neonatal abstinence syndrome, and childhood outcomes: executive summary of a joint workshop by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, American College of Obstetricians and Gynecologists, American Academy of Pediatrics, Society for Maternal-Fetal Medicine, Centers for Disease Control and Prevention, and the March of Dimes Foundation. *Obstetrics & Gynecology*, 130(1), 10-28.

³¹ ACOG Committee Opinion, Number 711 (2017)

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28. Opioid use in pregnant women presents risks for the fetus and newborn child. Maternal detoxification can increase the risk of fetal distress and fetal loss.³² As discussed in greater detail below, untreated opioid use disorder during pregnancy can have devastating consequences for the unborn baby due to the potential for repeated periods of withdrawal.³³ Other risks to the baby include stunted growth, preterm labor, fetal convulsions, and fetal death.³⁴ Long-term, studies have shown that toddlers and young school age children with prenatal opioid exposure are more likely to have impairments in cognition as well as poorer psychomotor and behavioral outcomes.³⁵ The mother may also be at increased risk of HIV, HBV, HCV, malnutrition and dangers associated with drug seeking behaviors.³⁶

C. Guidelines and Interventions for Pregnant Women with Opioid Use Disorder

29. In 2014, the World Health Organization published guidelines to promote evidence-based advice to health care providers on identifying and managing substance use and substance use disorders in pregnant women. The guidelines strongly recommended that opioid-dependent pregnant women be encouraged to use opioid maintenance treatment (methadone or buprenorphine) whenever available rather than to attempt opioid detoxification. The risk of harm from opioid maintenance treatment is very low as compared to the high risk of relapse to opioid use following detoxification or the “catastrophic” harm to both mother and fetus from failed detoxification. Also strongly recommended was that mothers who are on methadone or buprenorphine maintenance treatment be encouraged to breastfeed unless the risks outweighed the benefits.³⁷
30. In 2017, The American College of Obstetricians and Gynecologists’ (ACOG), Committee on Health Care for Underserved Women and the American Society of Addiction Medication (ASAM) issued recommendations and conclusions relating to opioid use and opioid use disorder in pregnancy. The Committee Opinion concluded that opioid use in pregnancy has sharply escalated, paralleling the opioid epidemic in the general population and that the use of illicit opioids during pregnancy is associated with an increased risk of

³² Hudak ML, Tan RC, Committee On D, Committee On F, Newborn, American Academy of P. Neonatal drug withdrawal. *Pediatrics*. 2012;129(2):e540-560.

³³ National Institute on Drug Abuse (NIDA), Treating Opioid Use Disorder During Pregnancy, National Institutes of Health; U.S. Department of Health and Human Services, July 2017

³⁴ *Ibid.*

³⁵ Baldacchino, A., Arbuckle, K., Petrie, D. J., & McCowan, C. (2014). Neurobehavioral consequences of chronic intrauterine opioid exposure in infants and preschool children: a systematic review and meta-analysis. *BMC psychiatry*, 14, 104. doi:10.1186/1471-244X-14-104.

³⁶ *Ibid.*

³⁷ World Health Organization: *Guidelines for Identification and Management of Substance Use and Substance Use Disorders in Pregnancy*. October 2014. Available at http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en/

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adverse outcomes. The Committee's opinion is that the current standard of care for pregnant women with opioid dependence is referral for medication-assisted therapy with methadone, but emerging evidence suggests that buprenorphine also should also be considered.^{38,39}

31. Recognizing the urgent need to develop clinical guidelines for professionals who care for pregnant women with OUD and their substance exposed infants, in 2018 SAMSHA published a comprehensive guide identifying effective interventions for pregnant women with OUD and their exposed infants. The guidelines ensure health professionals have access to and aware of up-to-date research addressing opioid use disorders and prenatal exposures. Focused on prenatal, infant and maternal postnatal care, the Guide "recommends feasible, standard approaches to the care of pregnant and parenting women with OUD and their infants that can be adopted in care settings throughout the United States." Recommended practices include prenatal screenings and assessments, use of pharmacotherapy during prenatal and post-natal care, screening and assessment for NAS along with early interventions strategies and developmental assessments for infant care.⁴⁰
32. A recent study published in the American College of Obstetricians and Gynecologists (ACOG) looked at women in Massachusetts with evidence of opioid use disorder who delivered a live born infant between 2012 and 2014. 2.3% (4,154) of deliveries were to women with evidence of opioid use disorder in the year before or after delivery. Two hundred forty-two women experienced an opioid related overdose (231 nonfatal, 11 fatal) in the year before or after delivery. The study found that the year after delivery was an especially vulnerable period for women with evidence of opioid use disorder. Specifically, the highest overdose rates occurred in the period 7-12 months after delivery. Women receiving pharmacotherapy had reduced overdose rates in the early postpartum period. This report demonstrates the need not only for support and intervention for women during pregnancy, but into the first year postpartum to prevent and reduce overdose events.⁴¹
33. Expanding access to MAT is critical to improving outcomes among pregnant women with opioid use disorders. However, despite the established benefits of MAT programs for this population, women may experience a variety of potential barriers to entering treatment and

³⁸ Winhusen T, Wilder C, Wexelblatt SL, Theobald J, Hall ES, Lewis D, et al. Design considerations for point-of-care clinical trials comparing methadone and buprenorphine treatment for opioid dependence in pregnancy and for neonatal abstinence syndrome. *Contemp Clin Trials.* 2014;39:158–65.

³⁹ ACOG Committee Opinion, Number 711 (2017).

⁴⁰ Substance Abuse and Mental Health Services Administration (SAMSHA). *Clinical Guidance for Treating Pregnant and Parenting Women with Opioid Use Disorder and Their Infants.* HHS Publication NO. (SMA) 18-5054. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2018

⁴¹ Schiff D, Nielsen T, Terplan Mishka, Hood M, Bernson D, Diop H, Bharel M, Wilens T, LaRochelle M, Walley A, Land T, Fatal and Nonfatal Overdose Among Pregnant and Postpartum Women in Massachusetts, *American College of Obstetricians and Gynecologists,* 2018;132(2):466–474.

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continuing treatment, and receiving supportive services across the continuum of care.⁴² Such barriers may include: program availability and/or capacity; limited access to family-centered treatment with integrated supports; limited care and long-term supports for infants born with NAS; and/or limited transportation, housing, and employment supports.⁴³ Women may also encounter psychosocial barriers, such as societal bias and stigma.⁴⁴

34. As a result of the potential treatment barriers, it is critical that healthcare workers who provide care for women with substance use disorders receive additional training so as to understand health workers providing care for women with substance use disorders during pregnancy need to understand the complexity of the woman's social, mental and physical problems and to provide the right advice and support throughout pregnancy and the postpartum period.⁴⁵
35. Creating and enhancing programs for postpartum women is also important. The first year postpartum is a very vulnerable time for women with opioid use disorder, and, as noted above, is associated with a high risk of an overdose event.⁴⁶

D. Neonatal Abstinence Syndrome

36. From 2004 and 2014, the diagnosis of opioid abuse or dependence among delivering mothers in Ohio grew by 491 percent.⁴⁷ One of the consequences of the increasing rate of maternal opioid use disorder is an increase in neonatal abstinence syndrome (NAS), a syndrome that may occur in opioid-exposed newborns shortly after birth.⁴⁸

⁴² Center for Substance Abuse Treatment. Substance Abuse Treatment: Addressing the Specific Needs of Women: Treatment Improvement Protocol (TIP) series 51; vol HHS publication no. (SMA) 09-4426. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2009. Cleveland, Lisa & Bonugli, Rebecca. (2014). Experiences of Mothers of Infants with Neonatal Abstinence Syndrome in the Neonatal Intensive Care Unit. *Journal of Obstetric, Gynecologic, and Neonatal Nursing : JOGNN / NAACOG*. 43. 10.1111/1552-6909.12306

⁴³ *Ibid.*

⁴⁴ Cleveland, *JOGNN / NAACOG* (2014).

⁴⁵ World Health Organization: Guidelines for Identification and Management of Substance Use and Substance Use Disorders in Pregnancy. October 2014. Available at http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en/.

⁴⁶ Schiff, *American College of Obstetricians and Gynecologists* (2018).

⁴⁷ Massatti, R., Falb, M., Yors., Potts, L., Beghly, C. & Starr, S., (2013, November) Neonatal abstinence syndrome and drug use among pregnant women in Ohio, 2004-2011. Columbus, OH: Ohio Department of Mental Health and Addiction Services.

⁴⁸ Hudak, *Pediatrics*. 2012.

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37. Neonatal abstinence syndrome is a clinical diagnosis given to infants who experience withdrawal signs and symptoms after in utero exposure to opioids. Withdrawal signs develop in 55% to 94% of opioid exposed infants, with 30-65% of those infants requiring pharmacologic treatment for severe withdrawal.^{49,50,51}
38. The clinical signs of NAS result from central nervous system hyper excitability and autonomic instability. NAS signs can begin within 24 hours of birth after heroin exposure, within 48 hours for short acting prescription opioids, and up to 72 to 96 hours after birth for newborns exposed to long acting opioids such as methadone and buprenorphine.⁵² The most prominent signs in NAS are tremors, poor feeding, excessive crying, loose stools, poor sleeping, and hyperirritability. Other signs of NAS include sneezing, yawning, hiccups, myoclonic jerks, skin breakdown and abrasions, vomiting, nasal stuffiness, and seizures in the most severe cases.⁵³
39. Over the last two decades, the US incidence of NAS has sharply increased from 1.19 per 1000 hospital births in 2000, to 5.63 in 2012.⁵⁴ During that same time period, the number of infants treated for the syndrome in US neonatal intensive care units increased five-fold.⁵⁵

⁴⁹ Hall, *Pediatrics* (2014).

⁵⁰ Patrick, *JAMA* (2012).

⁵¹ Hudak, *Pediatrics* (2012).

⁵² Hall, *Pediatrics* (2014); Hudak, *Pediatrics* (2012).

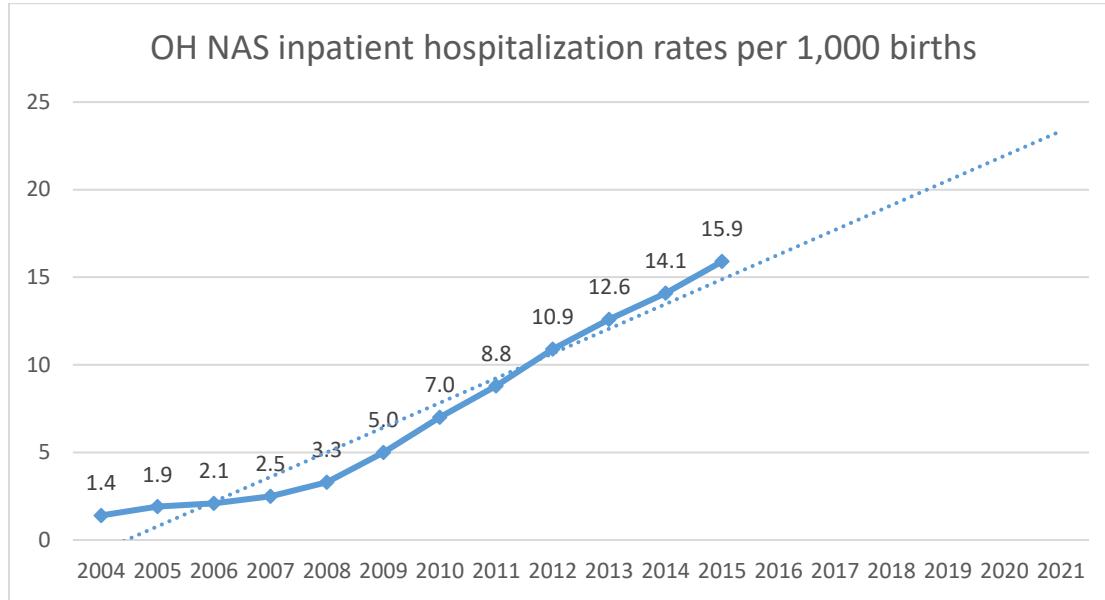
⁵³ Hudak, *Pediatrics*, (2012).

⁵⁴ Patrick, *JAMA* (2012).

⁵⁵ Patrick, *Journal of Perinatology* (2015).

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1. The Rapidly Increasing Rate of NAS in Ohio



40. Between 2006 and 2015, there were 11,283 hospitalizations resulting from Neonatal Abstinence Syndrome (NAS) in inpatient settings in Ohio. According to the Ohio Department of health, “in 2015 alone, there were 2,174 admissions, which equates to nearly six admissions per day.”
41. The diagnosis of NAS continues to increase across the State of Ohio. Since 2012, over 1% off all deliveries in Ohio had the diagnosis of NAS. This rate is projected to be above 2% in the year 2020.⁵⁶
42. The reason for this increase of babies diagnosed with NAS is multifactorial. Notably, the increase in the number of women of childbearing age with opioid use disorder has exposed more babies in utero to opioids.

⁵⁶ Health ODo. 2017 Ohio Neonatal Abstinence Syndrome Report. *Online*. Dec. 11, 2018. Available at https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/media/2017_nas_county_table.

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2017 Ohio Neonatal Abstinence Syndrome Report**Table 1: Hospitalizations* Among Ohio Resident Newborns for Neonatal Abstinence Syndrome**, 2006-2017**

Neonatal Abstinence Syndrome	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Neonatal Abstinence Syndrome inpatient discharges	305	369	477	715	953	1172	1482	1717	1919	2174	2223	1935
Medicaid Discharge	222	288	369	583	811	998	1322	1502	1741	1950	1986	1753
Non-Medicaid Discharge	83	81	108	132	142	174	160	215	178	224	237	182
Average length of days (LOS) in days	16	19.5	20.1	19.6	18.9	16.37	17.73	15.19	14.9	13.9	12.9	13.41
Total LOS (days)	4,892	7,200	9,580	14,006	17,965	19,181	21,834	26,085	28,580	30,153	28,656	25,954
Average charge***	\$39,561	\$59,033	\$59,580	\$72,158	\$64,911	\$59,847	\$57,813	\$61,469	\$68,666	\$61,241	\$61,598	\$65,127
Total charge***	\$12,066,087	\$20,982,542	\$28,419,546	\$51,592,956	\$61,860,258	\$70,140,821	\$85,678,946	\$105,542,816	\$131,770,486	\$133,138,341	\$136,932,674	\$126,020,134

*Hospitalizations occurred in Ohio hospitals to Ohio residents

**NAS reflects ICD-9 CM code 779.5 for 2006 - 9/30/2015 and ICD-10-CM code P96.1 for 10/01/2015 - 2016 (NAS Could be in primary or 18 secondary dx fields)

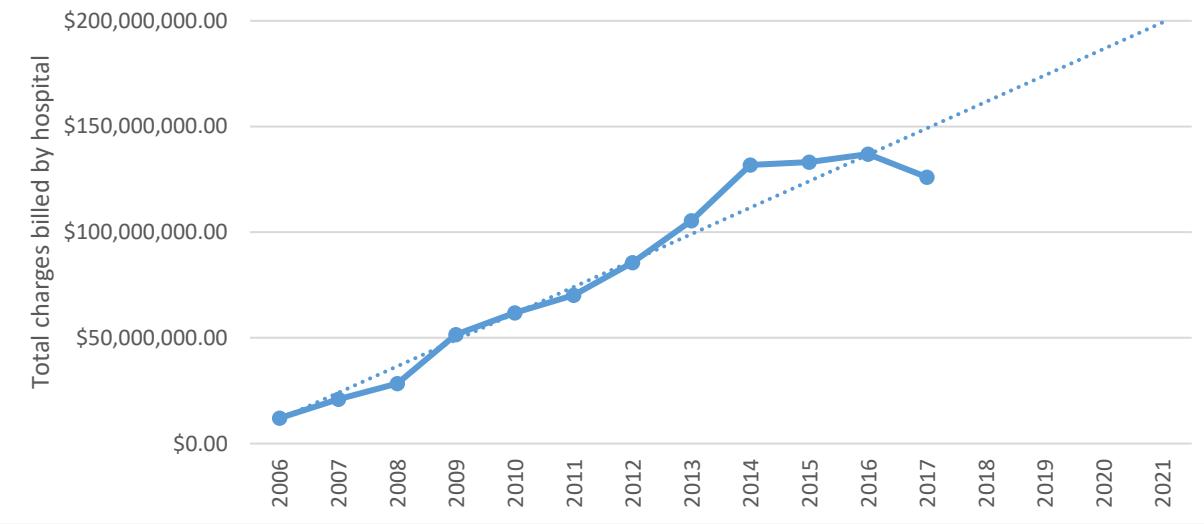
***Charges reflect charges billed by the hospital

Table 2: Births* to Ohio Residents in Ohio Hospitals, 2006-2017

Hospital Births	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Hospital births inpatient discharges	152,740	151,454	148,800	146,226	139,987	137,168	139,517	140,034	140,658	140,142	138,267	
Medicaid Discharge	60,976	59,830	61,461	65,062	63,710	62,429	67,364	65,415	67,308	67,009	63,792	64,808
Non-Medicaid Discharge	91,764	91,624	87,339	81,164	76,277	74,739	72,153	74,619	73,348	73,649	76,350	73,459
Average LOS (days)	3.4	3.5	3.5	3.6	3.6	3.6	3.8	3.7	3.7	3.7	3.7	3.8
Average charge**	\$6,838	\$7,870	\$8,660	\$9,680	\$10,336	\$11,452	\$12,977	\$13,604	\$14,570	\$15,494	\$16,695	\$17,812

*Hospital births reflect MSDRG codes 789-795 (Neonates and Newborns)

**Charges reflect charges billed by the hospital

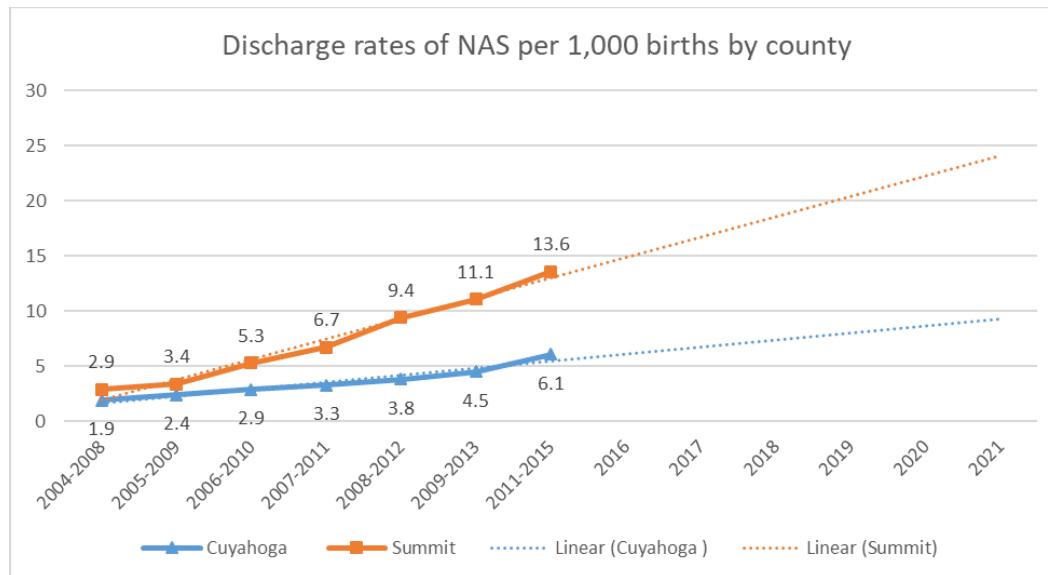
Inpatient hospitalization charges for infants with NAS in OH

43. Inpatient hospitalization for NAS infants corresponds to costly hospital expenditures – many of which are often shouldered by state Medicaid programs.

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2. The Rates of NAS in Cuyahoga and Summit Counties

44. In Cuyahoga County for the year 2017 there were 137 infants diagnosed with NAS, and in Summit County there were 71 infants. For the five-year period of 2013-2017, a total of 629 infants in Cuyahoga County and 426 infants in Summit County were diagnosed with NAS. Summit County is projected to have more than 2% of all births with the diagnosis of NAS by 2020.⁵⁷



3. Standard Treatments and Interventions for NAS

45. Babies born to mothers who use or are addicted to opioids need particular care and attention. By improving and standardizing the care these babies receive, OPQC expects to reduce the length of hospital stay for newborns and improve outcomes at discharge.
46. Given the underreporting of maternal drug use, traditional risk-based screening methods may not identify all newborns at risk for NAS and therefore underestimate in utero opioid exposure.^{58,59} Universal maternal drug testing improves the identification of infants at risk for the development of NAS. After adoption of universal maternal testing, the Cincinnati region has had a decrease in need for pharmacologic treatment for opioid-exposed infants

⁵⁷ *Ibid.*

⁵⁸ Wexelblatt, *The Journal of Pediatrics* (2015).

⁵⁹ Hall ES, Wexelblatt SL, Greenberg JM. Self-reported and Laboratory Evaluation of Late Pregnancy Nicotine Exposure and Drugs of Abuse. *Journal of Perinatology : Official Journal of the California Perinatal Association*. 2016;36(10):814-818.

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to 30% (unpublished data CCHMC NAS Task Force), compared to a statewide level of 42%.⁶⁰

47. There is no nationally recognized protocol for treatment, leading to substantial variation in practice, degree of opioid exposure and hospital length of stay. Through our statewide collaborations of OCHA and OPQC, we have created a standardized protocol to safely decrease the length of stay.⁶¹

- (1) All infants are scored every 3-4 hours around feedings with the modified Finnegan Scoring System. This scoring tool is performed by nurses and addresses 21 different components.
- (2) Nonpharmacologic treatment measures, including swaddling, skin-to-skin care, rooming in, and reduced stimulation are recommended.^{62,63}
- (3) Pharmacologic treatment support with opioids, such as morphine or methadone, has been shown to be the best treatment when medication is needed.^{64,65,66} Initiation of medication is done based on worsening withdrawal despite nonpharmacologic interventions. The updated protocol is attached as **Exhibit B** to this report.⁶⁷

48. Per OPQC data, the average overall length of stay for the 9,648 opioid exposed infants was 8.6 days during the period of 2014-2018. The proportion of infants requiring

⁶⁰ Ohio Perinatal Quality C. OPQC Neonatal Abstinence Syndrome Project. 2018; <https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/NAS/AP%20Calls/OPQC%20NAS%20Sustain%206.19.18.pdf>

⁶¹ Hall, *Pediatrics* (2014); Hall, *Pediatrics* (2015); Walsh, *Pediatrics* (2018)

⁶² Holmes AV, Atwood EC, Whalen B, et al. Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. *Pediatrics*. 2016;137(6).

⁶³ Howard MB, Schiff DM, Penwill N, et al. Impact of Parental Presence at Infants' Bedside on Neonatal Abstinence Syndrome. *Hospital Pediatrics*. 2017;7(2):63-69.

⁶⁴ Wexelblatt SL, McAllister JM, Nathan AT, Hall ES. Opioid Neonatal Abstinence Syndrome: An Overview. *Clinical pharmacology and therapeutics*. 2018;103(6):979-981.

⁶⁵ Kraft WK, Stover MW, Davis JM. Neonatal abstinence syndrome: Pharmacologic strategies for the mother and infant. *Seminars in perinatology*. 2016;40(3):203-212.

⁶⁶ Disher T, Gullickson C, Singh B, et al. Pharmacological Treatments for Neonatal Abstinence Syndrome: A Systematic Review and Network Meta-analysis. *JAMA Pediatr*. 2019.

⁶⁷ Ohio Perinatal Quality C. OPQC Recommended NAS Protocol Changes 2017. 2017. Available at <https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/NAS/OPQC%20Recommended%20NAS%20Protocol%20Changes%202017.pdf>

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pharmacologic treatment declined 6% from 48% to 42%, (about 134 infants/year statewide). For infants requiring pharmacologic treatment, the days of opioid treatment declined from 14.6 to 12.2 days, and length of stay declined from 18.2 to 16.2 days.⁶⁸

49. There are lasting effects on children diagnosed with NAS. Infants with opioid exposures are more likely than infants with no drug exposures to be diagnosed with: behavioral or emotional disorders, developmental delay, lower developmental scores, speech disorder, strabismus, increased incidence of torticollis and associated plagiocephaly, and more likely to be exposed to the hepatitis C virus.^{69,70}
50. Closer follow up is needed for opioid exposed infants compared to non-exposed due to the potential long-term complications stated above.⁷¹
51. Continued observation of opioid-effected children will be important in order to ensure optimal outcomes among this population, particularly given the potential that delays observed at two years of age may predict later learning disabilities or increased risk of addiction.⁷² Early intervention has been shown to help in childhood,⁷³ and should be provided to those infants with a NAS diagnosis.

4. Long-Term Care for Children and Families Impacted by Opioids

52. There are several emerging models for the long-term care of children and families impacted by opioids. Models providing family-centered care, comprehensive pediatric care, and developmental follow-up have all been demonstrated to improve outcomes.
53. Family-centered care involves providing direct pediatric care to opioid-exposed children, as well as direct medical and addiction care for parents in recovery. Such care can provide

⁶⁸ Ohio Perinatal Quality C. OPQC Neonatal Abstinence Syndrome Project. 2018. Available at https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/NAS/AP%20Calls/OPQC%20NAS%20Sustain%206_19.18.pdf.

⁶⁹ McAllister JM, Hall ES, Hertenstein GER, Merhar SL, Uebel PL, Wexelblatt SL. Torticollis in Infants with a History of Neonatal Abstinence Syndrome. *The Journal of Pediatrics*. 2018;196:305-308.

⁷⁰ Merhar SL, McAllister JM, Wedig-Stevie KE, Klein AC, Meinzen-Derr J, Poindexter BB. Retrospective review of neurodevelopmental outcomes in infants treated for neonatal abstinence syndrome. *Journal of Perinatology : Official Journal of the California Perinatal Association*. 2018;38(5):587-592.

⁷¹ McAllister, *Journal of Pediatrics* (2018); Merhar, *J of Cal. Perinatal Asso.* (2018).

⁷² Health ODo. 2017 Ohio Neonatal Abstinence Syndrome Report. 2018; https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/media/2017_nas_county_table

⁷³ Cannon JS, Kilburn MR, Karoly LA, Mattox T, Muchow AN, Buenaventura M. Investing Early: Taking Stock of Outcomes and Economic Returns from Early Childhood Programs. *Rand Health Q*. 2018;7(4):6.

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a continuum of interdisciplinary services integrated with primary health care. Potential services may include home visiting, case management, child developmental monitoring, speech and language, physical therapy, and occupational therapy, infant mental health services, referrals to legal services, and community referrals. Residential care for pregnant women with substance use disorders is another important component of family-centered care. Women may be able to stay at the residential facilities postpartum in order to continue to receive supportive services.

54. Comprehensive pediatric care programs provide multidisciplinary, long-term care for all pediatric needs, with possible links to adult care for parents. These programs seek to provide comprehensive long-term pediatric care from birth to adulthood.
55. Pediatric developmental follow-up programs provide longitudinal developmental assessment and support while pediatric primary care and other care takes place elsewhere.

5. Current Ohio Initiatives Relating to NAS

56. In response to the growing rates of NAS, Ohio implemented and tested models of care for pregnant women with opioid use disorder through a project known as Maternal Opiate Medical Supports (MOMS).
57. Compared to the Medicaid comparison cohort, MOMP pilot site participants: received more prenatal care visits; received more behavioral health services during pregnancy and after delivery; had fewer foster care placements and fewer cases of substantiated or indicated abuse and neglect.⁷⁴
58. In collaboration with the Ohio Department of Mental Health and Addiction Services (ODHMAS), the Ohio Department of Medicaid (ODM), and the Ohio Department of Health (ODH), OPQC has built on the initial MOMP project through its MOMP+ initiative. Through MOMP+, OPQC aims to optimize the maternity medical home and to improve outcomes for pregnant women with opioid use disorder and their infants.
59. The goal of MOMP+ is to improve care and outcomes by supporting maternity care providers in the care of pregnant women with opioid use disorder, working closely with those who provide medication assisted treatment and behavioral health therapy.
60. The Cincinnati Children's Hospital provides a pediatric developmental follow-up program to substance-exposed infants in the region through its Neonatal Abstinence Syndrome

⁷⁴ Presentation by Michele Walsh, MD and Michael Marcotte, MD, IHI National Forum Presentation, December 11, 2018. Available at http://app.ihi.org/FacultyDocuments/Events/Event-3135/Presentation-17169/Document-14004/Presentation_C5_Improve_Outcomes_for_Moms_and_Babies_Marcotte.pdf

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Clinic (“NAS Clinic). The NAS Clinic is one of the few clinics in the nation that follows substance-exposed infants over time. The Hospital’s NAS Clinic provides developmental screening, occupational and physical therapy, and education about nutrition and feeding to substance-exposed infants up to the age of two years old. The clinic is staffed by physicians, neonatal nurse practitioners, nurses, nutritionists, social workers, occupational therapists, speech therapists, and physical therapists, who provide multidisciplinary care during infants’ regular visits with their physicians. A social worker also meets with patients during clinic visits, addressing broad social needs including those of children in foster care placement. Children receive vision screens at six to eight months of age. Hepatitis C testing is done for infants with prenatal exposure to the virus. The NAS team also provides outreach and education in groups to mothers during pregnancy and postpartum.

IV. RECOMMENDATIONS FOR IMPROVING OUTCOMES

As set forth above, it is my opinion that the increasing number of women with opioid use disorder in Cuyahoga and Summit Counties, as well as growing incidence of NAS, is a significant public health issue. In order to address this urgent issue and improve outcomes, the Counties should develop and enhance multidisciplinary programs and services for early intervention, prevention, and support. Women with opioid use disorder need intensive support during their pregnancy, delivery and postpartum period. Infants diagnosed with NAS need treatment to wean them off of opioids and continuing care to minimize lasting effects. It is my professional opinion that the programs and interventions suggested below would help to reduce opioid use among women who are or will become pregnant, reduce foster placements, and reduce the risk of potential harms to infants and children:

A. Prevention

- ✓ Create and/or support programming within opioid maintenance clinics that is designed to delay pregnancy until a prospective mother’s health and dependence are improved;
- ✓ Educate women of childbearing age about substance abuse prevention;
- ✓ Establish community referral sources and services for pregnant women who are diagnosed with opioid use disorder and/or overdose including emergency rooms, women health clinics, community drug treatment centers among others;
- ✓ Provide counseling for women of childbearing age being treated for substance abuse or dependence on the impact of substance use on pregnancy;
- ✓ Implement the use of standardized screening tools early in prenatal care;
- ✓ Implement programs to improve and expand screening to identify women in need of intervention and treatment referral;

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- ✓ Screen for substance abuse as part of a comprehensive obstetric care plan at first prenatal visit in partnership with the pregnant woman to identify infants at risk for the development of NAS;
- ✓ Create public education campaigns to raise awareness of the health effects of opioid use prior to and during pregnancy;
- ✓ Invest resources in public education campaigns that aim to reduce barriers for women seeking treatment prior to conception and/or in early pregnancy by encouraging women to seek prenatal care and avoiding criminalizing pregnant women with opioid addiction.

B. Education and Training

- ✓ Educate physicians and nurses who treat women about the signs of addiction and utilize standardized screening tools for at-risk women;
- ✓ Enhance training for providers caring for pregnant women with opioid use disorders to understand the complexity of the woman's social, mental and physical problems ;
- ✓ Provide medical providers with training and need for screening tools early in prenatal care in order to identify pregnant women in need of treatment and/or other supportive services.

C. Supportive Services and Interventions

- ✓ Expand existing MAT treatment programs and develop supportive services to mitigate potential barriers to these services including program availability, capacity, and transportation;
- ✓ Develop programs that provide coordinated services between MAT providers, perinatal healthcare providers, and specialists in addiction medicine, behavioral health, and social services;
- ✓ Eliminate barriers to buprenorphine replacement therapy during pregnancy, which can decrease the severity of newborn withdrawal, allowing certified providers to increase the number of patients they are treating;
- ✓ Provide intensive support to mothers during pregnancy, delivery, and postpartum period. Including outpatient program for pregnant women with an available overnight housing unit providing substance abuse treatment, psychiatry, medical treatment and family planning;
- ✓ Implement coordinated care and connect mothers with outpatient support and treatment programs prior to discharge;
- ✓ Provide postpartum long-term addiction care;

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- ✓ Provide aftercare services so mothers can cope with their addiction and learn about the special needs of their infants;
- ✓ Create additional residential treatment facilities for both the mother and infant;
- ✓ Provide family based care to opioid exposed children as well as direct care for parents in recovery or maintenance;
- ✓ Ensure nurseries develop standardized evidence-based policies to assess and treat infants with NAS;
- ✓ Provide support to families to improve the outcomes for infants with NAS through breastfeeding, visits, and other support;
- ✓ Create pediatric developmental follow-up programs for opioid exposed infants.

V. DISCLOSURES AND RESERVATION OF RIGHTS

61. This report contains a true and accurate statement of my opinions in this matter. The matters cited in this expert report are based on my personal knowledge, education, and years of industry experience and, if called to testify, I will testify to the same effect.
62. This report is a statement of opinions I expect to express in this matter and the basis and reasons for those opinions. This report summarizes only my current opinions and analyses to date, which are subject to change depending upon ongoing discovery and additional information. I respectfully reserve the right to supplement my report in light of this and any other additional fact discovery, opinions by other experts, and/or trial testimony. I also respectfully reserve the right to provide rebuttal opinions and testimony in response to other experts, and rebuttal testimony in response to any fact witnesses. In connection with my anticipated trial testimony in this action, I may use as exhibits various documents produced in this litigation that refer to or relate to the matters discussed in this report. In addition, I respectfully reserve the right to use animations, demonstratives, enlargements of actual attachments, and other information in order to convey my opinions.
63. I understand that I may be asked to provide further opinions and analyses on other issues, including in response to analyses provided by other experts. I will do so at the appropriate time set by the Court.
64. The opinions in the report are stated to a reasonable degree of medical certainty in the field of the pediatrics and maternal-fetal issues as they relate to exposure and impact of in utero opioid exposure to infants.

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Executed on this 25th day of March, 2019, in Mason, Ohio.

A handwritten signature in black ink, appearing to read "Scott Wexelblatt". It is written in a cursive style with a horizontal line underneath it.

Scott Wexelblatt M.D.